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ABSTRACT

This study examined participation in year 12 and higher education in Australia. It updates a previous report by including findings from the 1995 cohort of the Longitudinal Study of Australian Youth for 1998 and 1999. Combining these data with those from four previous cohorts shows changes in the patterns of and influences on participation over the last 20 years. The report also addresses several policy and conceptual issues relevant to educational participation, such as rurality, ethnicity, indigenous status, socioeconomic background, part-time work, individual schools, and psychological factors. Findings show that 76% of the 1995 year 9 cohort participated in year 12 education, with females more likely to participate than males, and those with parents with high status occupations or more educated family backgrounds also more likely to participate. Findings also show that participation in higher education was at 31% in 1999 for the 1995 year 9 cohort. Gender differences had grown, with women more likely to participate in higher education. Students with language backgrounds other than English are consistently more likely to participate in higher education, and young people living in nonmetropolitan areas less likely to participate in higher education. Occupational background, school type, and achievement have become more weakly associated with higher education participation over time. (Contains 28 tables, 2 figures, and 17 endnotes.) (SLD)

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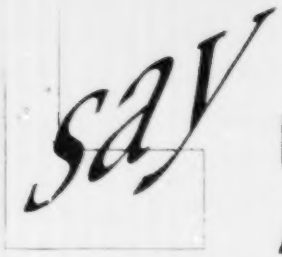

Longitudinal Surveys of Australian Youth

Research Report Number 17

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Patterns of Participation in Year 12 and Higher Education in Australia:

Trends and Issues

Gary N. Marks
Nicole Fleming
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December 2000

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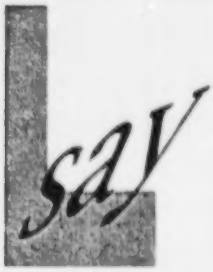

Longitudinal Surveys of Australian Youth

Research Report Number 17

PATTERNS OF PARTICIPATION IN YEAR 12 AND HIGHER EDUCATION IN AUSTRALIA: TRENDS AND ISSUES

Gary N. Marks
Nicole Fleming
Michael Long
Julie McMillan

This report forms part of the Longitudinal Surveys of Australian Youth: a research program that is jointly managed by ACER and the Commonwealth Department of Education, Training and Youth Affairs (DETYA).

The views expressed in this report are those of the authors and not necessarily of the Department of Education, Training and Youth Affairs

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EXECUTIVE SUMMARY

The report examines participation in education in Australia. In part it updates information on participation in Year 12 and higher education presented in LSAY Research Report Number 13 *Participation in Education and Training: 1980-1994*. The earlier findings, based upon the experiences of four youth cohorts, are updated by including the 1995 Year 9 LSAY cohort, using the 1998 and 1999 data for participation in Year 12 and higher education, respectively. Using the data for the five youth cohorts we are able to discuss changes in the patterns of and influences on participation over the last 20 years. Furthermore, this report addresses several policy and conceptual issues relevant to educational participation. These include rurality, ethnicity, Indigenous status, socioeconomic background, part-time work, individual schools and psychological factors.

In the examination of participation in Year 12 the main findings are:

- 76 per cent of the 1995 Year 9 cohort participated in Year 12 in 1998;
- females are more likely to participate in Year 12 than males, and the gap between males and females in Year 12 participation has increased since the early 1980s;
- Year 9 students whose parents work in high status occupations are more likely to continue on to Year 12, but the importance of parental occupation has declined since the early 1980s;
- Year 9 students from more educated family backgrounds are more likely to remain at school until Year 12, but these differences have also declined since the early 1980s;
- young people with language backgrounds other than English are more likely to participate in Year 12;
- students living in non-metropolitan areas in Year 9 are less likely to participate in Year 12; and
- Year 12 participation is strongly associated with achievement in literacy and numeracy in Year 9.

In the examination of participation in higher education the main findings are:

- participation in higher education was at 31 per cent in 1999 (for the Year 9 1995 cohort);
- gender differences have grown, with young women increasingly participating in higher education, 9 percentage points more than young men in 1999;
- students with language backgrounds other than English are consistently more likely to participate in higher education;
- young people living in non-metropolitan areas are less likely to participate in higher education but these differences are comparatively small;
- occupational background, school type and achievement have become more weakly associated with participation in higher education over time.

A number of policy and conceptual issues are examined.

Rurality: One important issue is the question of whether young people from non-urban areas are disadvantaged in terms of educational participation. A variety of measures of rurality were examined. It was found that the different measures provide much the same conclusion. On most measures, a gap of approximately 10 percentage points (in favour of urban students) was found in the Year 12 and higher education participation rates between the most urban and the most rural groups of students. In addition, the major difference in participation is between the 45 to 55 per cent of students in metropolitan areas and the remainder in regional and rural areas.

Ethnicity: Measures of ethnicity such as Non-English Speaking Background (NESB) and Language Background other than English (LBOTE) have been criticised for being too broad and heterogeneous. It is argued that such broad definitions obscure certain ethnic groups who have very poor educational outcomes leading to incorrect conclusions about their experiences of disadvantage. In order to examine the relationship between ethnicity and participation, a more detailed measure of ethnic background was constructed. It was found that the Year 12 and higher education participation rates of almost all groups of students whose fathers were born in non-English speaking countries were higher than for students whose fathers were born in Australia. In some instances the participation rates were substantially higher. The higher participation rates could not be accounted for by students' performance in the Year 9 achievement tests or their socioeconomic background, suggesting other factors are at work.

Indigenous Status: This study confirms that Indigenous students have considerably lower participation rates than non-Indigenous students. Of the Indigenous students sampled in 1995 when they were in Year 9, 47 per cent participated in Year 12, and 17 per cent undertook some form of higher education in 1999. These rates were much lower than for non-Indigenous students. Further analyses showed that *only part* of the explanation for the lower participation rates of Indigenous students relates to socioeconomic background and achievement in literacy and numeracy in Year 9.

Socioeconomic Background: One of the major debates surrounding socioeconomic background and educational outcomes is what aspects of socioeconomic background are most important. The analyses presented here indicate that cultural factors (measured by parents' education) have a stronger relationship with participation than wealth (measured by home possessions). Another issue is whether the influence of socioeconomic background on educational participation has declined over time. It was found that there has been a decline in the influence of occupational background on participation in both Year 12 and higher education.

Part-time Work: Part-time work while at school could either provide extra resources to help a student remain at school or could distract a student from their school work, leading to a decreased likelihood of participation. Our results suggest that part-time work in Year 11 has little or no effect on Year 12 participation, other things being equal. However, it does appear that working part-time for extensive periods of time in Year 12 is detrimental to participation in higher education.

Individual Schools: Approximately 7 per cent of schools have Year 12 participation rates significantly below that expected given the State, school type and academic mix of students. For these schools then, it would appear that there may be socio-cultural factors that affect the likelihood of their students reaching Year 12.

Psychological Factors: Factors such as level of engagement in school life (as shown through participation in extracurricular activities), academic self-concept, educational aspirations and parental expectations are often neglected in models of participation in education. The analyses presented here show that these factors are significant influences on Year 12 participation, with academic self-concept and aspirations substantially increasing the understanding of Year 12 participation.

Patterns of Participation in Year 12 and Higher Education in Australia: Trends and Issues

1. INTRODUCTION

One of the most significant changes in Australian education during the last two decades has been the increase in the percentage of students who remained at school to complete secondary school. The percentage of commencing secondary students remaining to the final year of school rose from 35 per cent in 1980 to 77 per cent in 1993. One of the explanations proposed for the rise in school retention rates was that the availability of full-time jobs for teenagers had declined. However school retention rates continued to rise through the 1980s, even when the availability of jobs improved. This is partly explained by the policy initiatives taken by education authorities to improve school completion rates. Since 1993 the holding power of schools has declined so that in 1998 the apparent retention rate to the final year of secondary school was 72 per cent. Since 1976 the secondary school completion rate has been higher for girls than boys and, in 1995, 78 per cent of girls, compared to 66 per cent of boys, remained to the final year of school (Australian Bureau of Statistics, 1999).

Similarly there has been a dramatic increase in higher education. In 1999 total higher education enrolments were 686,000, more than twice the 330,000 students enrolled in 1980 (DETYA, 2000:8, 15). Over the last decade, the growth in higher education enrolments has been between 2 and 10 per cent per annum, which is much higher than the population growth rate. Of students enrolled in 1998, around 276,000 (40 per cent) were commencing students. Of commencing students, 56 per cent were female and 44 per cent male (DETYA, 1998). Much of this increase in higher education enrolments was a flow-on from the substantial rise in secondary school completion rates, although policy changes such as the introduction of the Higher Education Contribution Scheme (HECS) have contributed to the increase in the number of available higher education places.

During the last two decades there have been a number of important policy changes in regard to participation in higher education. From 1973 to 1992, university students did not pay tuition fees but since 1989 students have paid for a proportion of the costs of tuition through an income contingent loan scheme known as the Higher Education Contribution Scheme (HECS). Under this scheme students can pay a tuition fee either at the time they enrol or as part of their taxation obligations when their income reaches a specified level. In the first years of operation the tuition fees were uniform across courses but from 1997 the levels of fees became differentiated between courses and have been increased somewhat.

Although there have been substantial increases in educational participation over the last two decades, this does not necessarily mean that social equity has improved over this period. Much of this report focuses on the participation of social groups in both the final year of secondary school (Year 12) and higher education. The report presents the survey estimates of participation for a range of social and educational groups. In addition it investigates the equity issue more thoroughly by examining the participation of students from different social groups relative to their achievement in literacy and numeracy in Year 9, and other factors.

The report also addresses in detail several policy and conceptual issues relevant to educational participation. These include the educational disadvantages experienced by non-urban students and differences in participation by students with different ethnic backgrounds (including Indigenous students). The report also examines the influence on participation of different aspects of socioeconomic background – financial and educational (cultural) resources. The issue of whether part-time work decreases participation is also analysed. The question of whether individual schools make a substantial contribution to participation, over and above the influence of other

factors such as the academic mix of students, is investigated. In the final part of the issues chapter, the role of psychological factors, net of the influence of sociodemographic and educational factors, is addressed.

Background and Organisation of this Report

The report is, in part, an update of the 1999 report on educational participation (LSAY Research Report Number 13 *Participation in Education and Training: 1980-1994* by Long and colleagues). Data from the 1995 Year 9 LSAY cohort, most of whom completed school in 1998, are used to update the earlier findings.

Since each of the earlier LSAY Research Reports (Numbers 1, 11 and 13) on participation included a literature review, a literature review is not included in this report. We direct readers interested in the earlier literature to these LSAY reports (Lamb, 1996; Marks & Fleming, 1999; Long, Carpenter & Hayden, 1999).

The substantive analyses in this report are organised into three chapters. The first discusses Year 12 participation, the second examines participation in higher education, and the third addresses several policy and conceptual issues relevant to educational participation. These include the effects of living in regional and rural areas, wealth, the role of individual schools, and psychological factors. These issues are examined using the most recent data from the LSAY project.

The chapters on participation in Year 12 and higher education each comprise two parts. The first discusses participation rates – both the extent of participation relative to comparison groups and trends over time. The second part uses multivariate analyses to measure the independent effect of various factors on participation, and trends over time in the strength of these influences.

Patterns of participation are examined by gender, occupational and education background, ethnicity, region, State or Territory, school type and achievement in literacy and numeracy tests. These measures are similar to those reported by Long, Carpenter and Hayden (1999:120).

The discussions of the influences on participation comprise the second parts of the chapters on Year 12 and higher education participation. These discussions are based on the estimates obtained from analyses of causal models of participation, specifying the following influences: gender, occupational and educational background, ethnicity, residence in a metropolitan or non-metropolitan area, State or Territory, school type and achievement (in literacy and numeracy).

When discussing the participation of social and demographic groups, this report uses several measures of participation: participation rates; absolute percentage differences; participation ratios; and (unadjusted) odds ratios. In discussions of the multivariate analysis of the influences on participation, the statistics used are logistic regression estimates, odds ratios and predicted probabilities. These are discussed in the next chapter.

2. METHODS

This chapter is intended to provide the reader with information to facilitate their understanding of the results presented in tables and discussed in the text. The initial parts provide summaries of the LSAY data used in this report and an explanation of the summary measures of participation. The next part focuses on multivariate analysis. We discuss why multivariate analyses are necessary, the question of model specification (that is, what measures to include in the analyses), the particular multivariate procedure used in this report (logistic regression), and how to interpret the results, with particular emphasis on the use of odds ratios.

For readers only interested in descriptions of patterns of participation (the bivariate results), it is not necessary to read the description of multivariate techniques provided in the third part of this chapter.

Data

This report uses data from the four *Youth in Transition* (YIT) cohorts and the 1995 Year 9 *Longitudinal Surveys of Australian Youth* (LSAY) cohort. The YIT cohorts are age-based cohorts born in 1961, 1965, 1970 and 1975 with original samples of between 5000 and 6000 students. The LSAY cohort comprises over 13 000 students who were in Year 9 in 1995. Details on the YIT and 1995 Year 9 samples can be found in Appendix 1. All analyses presented in this report have been weighted for differential school and student participation rates and respondent attrition.

A description of how the variables used in this report were measured and their distributions are provided in Appendix 2.

Measures of Participation

For the four YIT cohorts, participation is measured by participation in Year 12 and higher education (at a university or College of Advanced Education) by age 19 from the base of students in each original sample. In contrast, participation in the 1995 Year 9 cohort is assessed by participation in Year 12 in 1998 and participation in higher education (universities) in 1999. Appendix 3 demonstrates that differences in sample design between these two groups of studies will not undermine conclusions about the patterns of participation.

There are a variety of ways participation rates can be summarised. These include participation rates, absolute percentage differences, participation ratios, relative percentage differences and odds ratios.

It is easiest to explain the different summary measures by way of example. The following table is taken from Long, Carpenter and Hayden (1999:38) who presented the hypothetical result for educational participation in Year 12 by gender.

Table 1 Percentage of cohort who participated in Year 12 (for two hypothetical samples)

	Cohort 1	Cohort 2
Total Cohort	40	80
Gender		
Male	35	75
Female	45	85

Focusing initially on Cohort 1, the *absolute participation rate* was 40 per cent, with 35 per cent of males and 45 per cent of females participating. Long, Carpenter and Hayden (1999:38) note three ways in which the gender difference can be reported.

- Report the difference as 10 percentage points. This is the *absolute percentage difference* between males and females for Year 12 participation. When the text refers to a 'gap' of so many percentage points in participation rates, it is referring to the absolute percentage differences.

- Report the *participation ratio* of female to male completion (45/35=1.29). That is, females participate 1.29 times more than males. Similarly it can be reported that females are 29 per cent more likely to complete Year 12 than males. This is the *relative percentage difference* between males and females. In this report we use participation ratios rather than relative percentage differences.

- Report the ratio of the odds of a female completing rather than not completing Year 12 (45/55 = 0.82) to the odds of a male completing rather than not completing Year 12 (35/65= 0.54). The ratio of these two ratios is called the *odds ratio* (0.82/0.54=1.52).

  Odds ratios are always positive. An odds ratio equal to one signifies no effect of the variable concerned on participation. Odds ratios above one indicate an increased likelihood of participation and odds ratios below one indicate a decreased likelihood. The further an odds ratio is from one, the stronger the effect of the variable.

  This measure has several desirable properties. First, it uses more information in describing the association between two variables; in this example being male, being female, participating and not participating. Thus it is a more 'complete' measure. Second, it has the property of 'marginal invariance', that is, the strength of an association between two measures is not affected by their distributions. Third, odds ratios are also used to interpret the effects of factors on participation in a multivariate context (see below).

Long, Carpenter and Hayden (1999:38) note that these three ways of reporting can lead to quite different interpretations when comparing the results of Cohort 2 with Cohort 1.

- The absolute percentage difference is unchanged.

- The ratio or relative percentage difference has declined from 1.29 to 1.13.

- The odds ratio has increased. It is 1.52 for Cohort 1 and 1.89 for Cohort 2.

This example illustrates that odds ratios are not always appropriate measures of equity since in this instance it is hard to argue that the level of equity has deteriorated. In the context of rising overall participation levels, odds ratios can increase as the absolute percentage difference declines. Because of this characteristic, in the context of rising participation rates a decline in the odds ratio is strong evidence of an increase in equity or decrease in inequality.

In this report all three measures are used since the exclusive use of one measure may lead to misleading interpretations.

Multivariate Analysis

Multivariate analyses are important for several reasons. First, it is unlikely that only one factor determines participation in education. Rather, a range of factors such as students' socioeconomic background, performance at school, ethnic background and attitudes about school influence participation in Year 12 and higher education. It is important to include those factors that have

substantial effects on participation in the analysis rather than examining only one factor in isolation.

A second reason for multivariate analysis is the issue of spuriousness. It is important at a theoretical level to know if a factor's influence is spurious, that is, if its influence can be attributed to the influence of other factors. For example, if students from particular ethnic backgrounds participate at lower levels than other students, this result may be not because of the students' ethnicity *per se*, but because of their socioeconomic background.

The third reason is the corollary of the second. It is important to know the net effect of each factor. For example, Indigenous students participate in education at lower levels than other students. Some of this difference is due to the fact that on average Indigenous students come from lower socioeconomic backgrounds. By controlling for socioeconomic factors, the effect of being Indigenous net of differences in the socioeconomic backgrounds of Indigenous and non-Indigenous students can be assessed. This is important because it gives an indication of the importance of non-economic factors (for example health and culture) in the lower participation rates of Indigenous students, and thus can help identify policy priorities.

Finally, multivariate analyses provide an understanding of the process by which a factor influences participation. They allow an assessment of whether a particular factor directly influences participation, or whether its effects on participation are indirect, via intermediary (mediating) variables.

For this report, multivariate analyses were performed to understand whether the differences observed in cross-tabular data (for example in Tables 2 and 5) can be attributed to other factors. For example, can differences in participation between occupational background groups be accounted for by performance in the Year 9 achievement tests, the type of school attended and/or other factors? These multivariate analyses allow researchers to estimate the independent effect of each influence on participation.

Model Specification

The use of multivariate analysis raises the question of model specification; that is, which factors should be included in the analysis. It could be argued that the model should include all variables that influence educational participation. However, there are likely to be dozens of factors that are correlated with participation. Including all these factors in a single analysis increases the complexity in the interpretation of the results and may cause statistical problems. Model specification should be guided by the most appropriate and parsimonious specification for the particular research question.

The analyses in this report are based on a core model which includes the most theoretically and empirically important influences. The key variables identified for inclusion have been selected on the basis of extensive reviews of the literature, earlier ACER analyses of longitudinal data, and their policy relevance (see Long et al, 1999). The core model is comprised of gender, parental occupational and educational background, father's country of birth, region (urban/non-urban), State[1], school sector and Year 9 achievement. This model allows the estimation of the influence of each factor net of the other factors included in the model. In some of the discussions, these results are compared with the results from the bivariate analyses to assess spuriousness, mediating effects and other issues. This model is also used as a base for the study of the effects on participation of additional factors such as part-time work and psychological factors.

Logistic Regression

Multivariate logistic regression is used because of the dichotomous nature of the dependent (outcome) variable, educational participation.[2] Logistic regression coefficients are presented in a

number of tables throughout the report. The sign of the logistic coefficient indicates if the factor has a positive or negative influence; that is, whether it increases or decreases participation. The interpretation of the results differs according to whether the independent variable is dichotomous, categorical or continuous.

For dichotomous independent variables (that is, variables which have only two categories such as male/female), the size of the logistic regression coefficients can be compared. For example the effects of gender and region can be compared. In 1995, the effect of gender on Year 12 participation was higher than the effect of region (Table 3).

For categorical independent variables (which comprise three or more categories, such as occupational groups), the size of the regression coefficients can also be compared but the size is always relative to the reference category. For example, Table 3 shows that the effect on Year 12 participation of coming from a professional background (relative to a manual background) is greater than the effect of coming from a clerical, sales or personal service family background (relative to a manual background). The choice of the reference category does not change the relative differences in the logistic regression coefficients between categories.

For continuous independent variables such as a scale measuring achievement in literacy and numeracy, the regression coefficient represents the effect on the dependent variable for a one unit change in the independent variable.[3] Therefore the interpretation of the strength of an effect needs to take into account the way in which the variable was measured. It is sometimes more meaningful if a difference other than one unit is focused on. One example is the self-concept of ability measure, which is a five point scale. Rather than focusing on a one unit difference, it is more fruitful to compare students at each end of the scale; that is, to compare students who judged they were performing very well with students who judged they were performing very poorly.

The significance tests for logistic regression are the same as for other parametric statistics; that is, tests of the probability of the null hypothesis. Statistically significant estimates are indicated in the tables by asterisks if the probability of the null hypothesis is less than 0.05 (that is 5 chances in one hundred) (*), less than 0.01 (**), or less than 0.001 (***).

Odds Ratios

In this report, the logistic regression coefficients (and their statistical significance) are presented in tables. The logistic regression coefficients are provided because the interpretation of continuous variables is so dependent on the way they are measured, and because of the relativities between categories in a categorical variable. However, when the results are discussed in the text, the logistic regression coefficients are converted to odds ratios, which are more readily interpretable. (The odds ratios are calculated by taking the exponent of the logistic coefficient). Presentation of the raw logistic regression coefficients in the tables allows readers to check their interpretations of the tables in the text and also to make their own comparisons.

It is important to note that odds ratios in the multivariate context are net effects; that is, an odds ratio is the effect (odds) of a factor on participation, having taken into account the influence of other factors. However in every other way the interpretation of these odds ratios are identical to the odds ratios described in the preceding section. Take an odds ratio of 2.0 derived from a logistic regression coefficient of 0.69 for a particular characteristic. The odds ratio of two indicates that respondents with that characteristic are twice as likely to participate (rather than not participate) compared to respondents without that characteristic, net of other factors in the analysis.

Predicted Probabilities

Since it may be desirable to monitor the participation rates of particular social groups (for example young people from lower socioeconomic backgrounds) in a multivariate context (for example after controlling for literacy and numeracy achievement), the predicted probabilities of participation can be calculated for persons with particular characteristics. In this report we calculate the predicted probabilities of two groups of young people: those students from professional backgrounds with better than average achievement levels; and those students from manual backgrounds with the same achievement level. The predicted probabilities are the average probability of participation for young people from each group.[4]

3. PARTICIPATION IN YEAR 12

Patterns of Participation in Year 12

Table 2 presents Year 12 participation rates for the five cohorts, and by social background and other characteristics for each cohort. The figures presented in Table 2 for the four oldest cohorts are also presented in LSAY Research Report Number 13 (Long, Carpenter & Hayden, 1999).

These figures show the well-documented step rise in Year 12 participation from less than 40 per cent in the early 1980s to well over 70 per cent in the two youngest cohorts. The slight downturn in Year 12 participation between 1994 and 1998 is also found for the ABS retention rates (ABS 1999:69). Appendix 4 compares the Year 12 participation rates presented here with the apparent retention rates calculated by the Australian Bureau of Statistics.

Gender

The gender gap in Year 12 participation has increased during the period studied. In the cohort born in 1961, the Year 12 participation rate for girls was only 3 percentage points higher than that for boys. In the cohort four years younger (born in 1965), this gap (the absolute percentage difference) had increased to 5 percentage points. For the next two cohorts (born in 1970 and 1975) the gender gap had increased further to 7 and 8 percentage points respectively. For the youngest cohort the gender gap had increased again to around 10 percentage points.[5]

Socioeconomic Background

Students with parents in professional occupations show consistently higher rates of Year 12 participation in all five cohorts. In the 1961 cohort, 61 per cent of students from professional backgrounds participated in Year 12, this figure rising to around 90 per cent for the two youngest cohorts. Among students from manual occupational backgrounds in the oldest (1961) cohort only about a quarter reached Year 12, rising to about 70 per cent in the youngest two cohorts (Table 2).

Table 2 shows that the absolute percentage difference in Year 12 participation rates between occupational background groups has declined over time. In the 1961 cohort the difference in participation between students from professional and unskilled manual backgrounds was around 30 percentage points. In the 1995 Year 9 cohort the difference was 17 percentage points. The participation ratio of the highest participating occupational group to that of the lowest participating group also shows a decline. In the 1961 cohort this figure was 2.9 compared to 1.3 for the two youngest cohorts. The odds ratios provide further evidence of a reduction in social inequality in Year 12 participation. For the 1961 and 1965 cohorts the odds ratio of participation/non-participation for the highest and lowest participating groups is 5.9. This compares with odds ratios of 3.7 and 3.3 for the youngest two cohorts.

Parental education also relates to Year 12 participation. In order to maintain comparability between the Youth in Transition (YIT) and the Year 9 cohorts the measure of parental education is simply a higher education/non-higher education dichotomy. For the 1961 cohort, just over 50 per cent of students from families in which the mother had a higher education qualification reached Year 12. For the two youngest cohorts, this figure was around 90 per cent.

As in the case for occupational background, the gap in Year 12 participation between students from families with higher education qualifications and other students has declined over time (Table 2). In the 1961 cohort the gap (absolute percentage difference) is 19 percentage points compared with 11 percentage points in the youngest cohort. The participation ratios also indicate a decline. The higher education/non-higher education background participation ratio was 1.5 and 1.9 for the 1961 and 1965 cohorts, respectively, declining to around 1.2 for the two youngest

cohorts. The odds ratios tell a similar story, and confirm that participation in Year 12 is now more evenly distributed by socioeconomic background.

Ethnicity

Year 9 students from non-English speaking backgrounds display substantially higher levels of Year 12 participation than do other students. In the 1961 and 1970 cohorts, the rate of Year 12 participation was 5 percentage points higher among students with fathers born in non-English speaking countries compared to students with Australian-born fathers. There is no discernible trend over time, although if the result for the 1965 cohort is disregarded then there is an increasing gap (in the absolute percentage difference). In the youngest cohorts the gap is around 10 percentage points.

Region

Table 2 uses two measures of region. The first simply distinguishes metropolitan from non-metropolitan students.[6] Table 2 indicates that there is a gap in Year 12 participation between metropolitan and non-metropolitan students across the various cohorts of between 5 and 13 percentage points. Approaching the issue of regional differences in another way by focusing on quartiles of population density, confirms that students from rural areas are substantially less likely to participate in Year 12. The absolute difference in Year 12 participation between students from the most and least dense population quartiles ranges from 10 to 22 percentage points among the cohorts.[7]

There are indications that the rural-urban difference in Year 12 participation has declined over time. For the 1961 cohort, the participation ratio of metropolitan to non-metropolitan students was 1.5. For the younger cohorts this ratio was between 1.1 and 1.2. Similarly the participation ratio for students from the most dense population quartile to the least dense declined from 1.4 in the 1961 and 1965 cohorts to 1.3 in the 1975 cohort and 1.2 in the 1995 Year 9 cohort.

State or Territory

The well-documented differences in school retention between the Australian States and Territories are reflected in these data. The Australian Capital Territory consistently shows the highest rate of Year 12 participation and Tasmania and the Northern Territory, the lowest rates. For the 1995 Year 9 cohort, students from New South Wales, Victoria, Queensland and South Australia show similar levels of Year 12 participation.

School Type

One of the most dramatic changes in Year 12 participation is the substantial decline in school sector differences. In the 1961 cohort only 30 per cent of those who had attended government schools in Year 9 participated in Year 12. For that cohort, the participation ratio of students from independent to government schools was 2.9. In contrast, in the youngest cohort 71 per cent of those who attended a government school in Year 9 went on to participate in Year 12, with the comparable participation ratio declining to 1.2. Overall, Year 12 participation among students from independent schools has not changed greatly since the early 1980s. In contrast, Year 12 participation among students who attended either government or Catholic schools in Year 9 has increased substantially. In the 1995 Year 9 cohort, Year 12 participation among students from Catholic schools was almost as high as that of students from independent schools.

Table 2 Participation in Year 12, 1980-1998, by Cohort and Background (per cent of group)

Cohort	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1998*
Of Total Cohort	35	37	55	78	76
Gender					
Male	34	34	52	74	71
Female	37	39	59	82	81
Parents' Occupation					
Professional	61	65	76	90	87
Managerial	45	49	61	79	81
Clerical /Personal Service	36	42	61	83	79
Skilled Manual	30	29	48	76	71
Semi-Skilled Manual	21	24	50	71	67
Unskilled Manual	28	24	44	73	70
Parents' Education					
Higher Education	54	68	75	95	87
Not Higher Education	35	35	54	76	76
Father's Country of Birth					
Australia	35	35	55	76	74
English Speaking	33	33	56	79	76
Non-English Speaking	40	47	60	85	84
Region					
Non-Metropolitan	28	33	53	72	69
Metropolitan	41	40	58	82	81
Region (Population Density)					
Most Rural Quartile	32	33	51	67	68
Second Quartile	28	29	49	76	73
Third Quartile	37	40	60	82	79
Most Urban Quartile	45	46	61	89	83
State or Territory					
New South Wales	36	33	50	71	77
Victoria	33	37	55	82	79
Queensland	37	41	64	86	77
South Australia	36	42	61	90	75
Western Australia	35	39	58	74	69
Tasmania	26	26	38	60	55
Australian Capital Territory	69	71	80	95	83
Northern Territory	11	18	50	64	58
School Type					
Independent	88	84	88	96	87
Catholic	44	45	61	83	86
Government	30	31	48	74	71
Achievement in Literacy & Numeracy					
Highest Quartile	62	61	83	92	89
Third Quartile	45	36	57	83	84
Second Quartile	29	31	51	71	73
Lowest Quartile	25	16	22	58	59

Achievement in Literacy and Numeracy

An important correlate of Year 12 participation is achievement in literacy and numeracy. In these studies, achievement is measured by students' performance in tests on literacy and numeracy performed at either 10 or around 14 years of age. In each cohort there is an 'achievement gradient' with the highest achieving quartile of students most likely to participate in Year 12, followed by the next and subsequent quartile, with the quartile performing least well in the achievement tests least likely to participate in Year 12. The steepness of the achievement gradients suggests that student achievement in school is probably the strongest correlate of Year 12 participation.

There is some indication that Year 12 participation is becoming less associated with achievement in literacy and numeracy. In the two youngest cohorts, Year 12 participation was less strongly linked to achievement than in the three oldest cohorts. In the youngest cohorts nearly 60 per cent of the lowest achieving quartile participated in Year 12 compared to figures of 25, 16 and 22 per cent for the 1961, 1965 and 1970 cohorts. The participation ratios of the highest to the lowest achievement quartiles declined from 2.5 in the 1961 cohort to 1.6 and 1.5 in the 1975 YIT and 1995 Year 9 cohorts respectively. This suggests that senior secondary schooling is becoming more broadly based, and hence diverse, in the range of students enrolled.

Influences on Participation in Year 12

In this section we use multivariate analyses to examine the net impact of a variety of factors on Year 12 participation. These factors include gender, parental occupational[8] and educational background, father's country of birth, region (urban/non-urban), State, school type and Year 9 achievement. The reasons for using multivariate techniques are discussed in Chapter 2.

Table 3 presents the estimates obtained from logistic regression analysis of the model of participation. The odds ratios for selected social background and school characteristics are presented in graphical form in Figure 1. This graph provides an overall picture of the relative strength of influences and trends over time.

Gender

Gender differences in Year 12 completion have increased over time (Table 3). For the 1961 cohort, the female to male odds ratio is 1.4. During the 1990s, the odds ratio increased to around 2.0. These odds ratios for the youngest two cohorts are larger than the unadjusted odds ratios (calculated from the figures in Table 2). Therefore, controlling for differences in school type and other factors has increased the gender difference.

Socioeconomic Background

Parents' occupation and education both influence Year 12 participation. As expected, the odds ratios for students from professional and, to a lesser extent, managerial backgrounds compared to students from manual backgrounds are greater than one. This effect is net of the school achievement, school type and other factors in the model. Due to collinearity between professional occupations and parents' (higher) education, it is not possible to interpret the effects for these two variables presented in Table 3.

The results in Table 4, which are the estimates for the occupation variables for the same model but excluding parental education, are more interpretable. These estimates show a decline in the benefit that a professional family background has on participation in Year 12. In the early 1980s the odds of students with professional backgrounds participating in Year 12 (relative to not participating) were 3 to 4 times those for students from manual backgrounds. In the mid and late 1990s the odds ratio had declined to around 2.0, an odds ratio comparable to that for gender.

Table 3 Effects on Year 12 Participation, 1980-1998

Cohort	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1998*
Intercept	-1.25***	-1.59***	-0.46**	0.48***	0.74***
Gender					
Male	-	-	-	-	-
Female	0.37***	0.18	0.17	0.64***	0.67***
Parents' Occupation					
Professional	0.95***	1.23***	0.71***	0.42*	0.64***
Managerial	0.55***	0.74***	0.22	0.03	0.44***
Clerical /Personal Service	0.07	0.60***	0.38	0.26	0.43***
Manual	-	-	-	-	-
Parents' Education					
Higher Education	0.05	0.67***	0.64*	1.31***	0.28**
Not Higher Education	-	-	-	-	-
Father's Country of Birth					
Australia	-	-	-	-	-
English Speaking Country	-0.13	0.12	0.08	0.12	0.09
Non-English Speaking Country	0.72***	1.09***	0.59***	0.79***	0.60***
Region					
Non-Metropolitan	-0.48***	0.0	0.04	-0.40***	-0.46***
Metropolitan	-	-	-	-	-
State or Territory					
New South Wales	-	-	-	-	-
Victoria	-0.21	-0.01	-0.05	0.71***	0.04
Queensland	0.11	0.12	0.52**	1.03***	0.35***
South Australia	0.06	0.36*	0.46*	1.52***	-0.15
Western Australia	0.09	-0.04	0.18	0.11	-0.49***
Tasmania	-0.15	-0.58	-0.49	-0.38	-0.81***
Australian Capital Territory	1.24**	1.40**	0.58	1.45*	-0.23
Northern Territory	-0.24	-0.36	0.43	-0.18	-0.84*
School Type					
Independent	2.20***	1.98***	1.88***	0.98***	0.45***
Catholic	0.46***	0.47***	0.35*	0.21	0.62***
Government	-	-	-	-	-
Achievement (Standardised)	1.05***	0.83***	0.93***	0.82***	0.71***

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

The unadjusted odds ratios (calculated from the cross-tabular analyses in Table 2) are larger because some of the overall effect of socioeconomic background can be attributed to differences in performance in the Year 9 achievement tests and school type. In the case of the 1995 Year 9 cohort the unadjusted odds ratio for students from professional and manual backgrounds was around 3 compared to around 2 for the multivariate analysis.

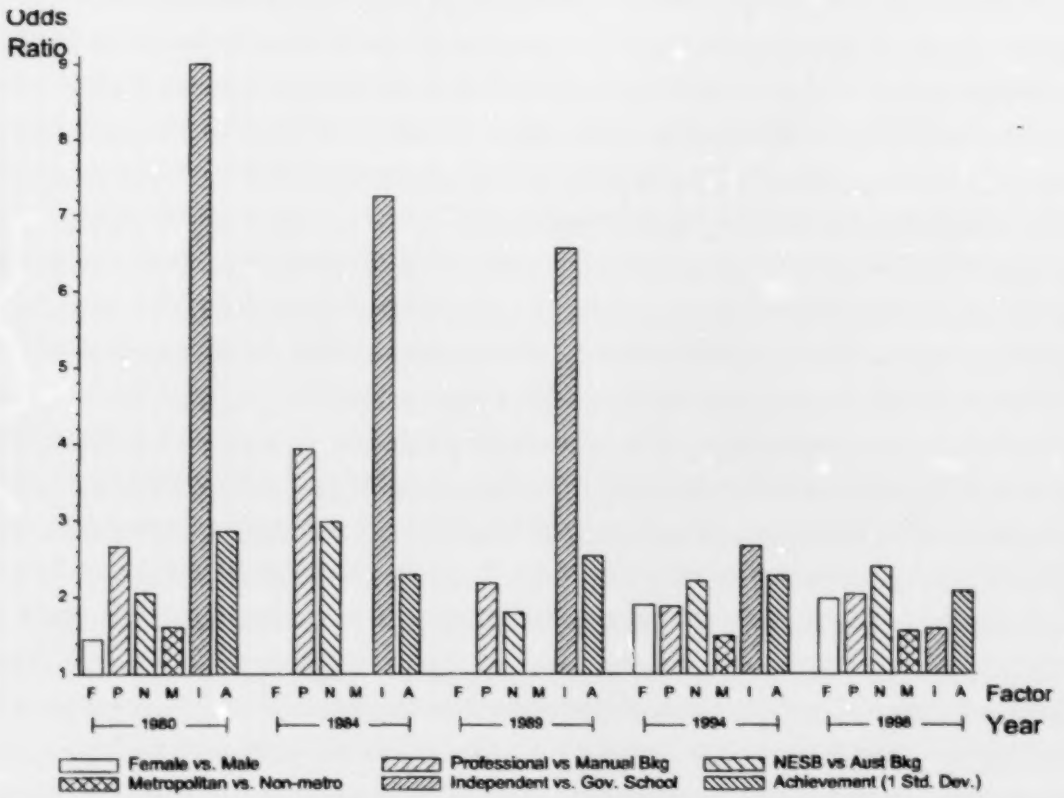

Figure 1 Effects of Selected Social Background and School Factors on Participation in Year 12, 1980-1998

Ethnicity

Ethnicity (measured here by father's country of birth) is a significant influence on the likelihood of participation in Year 12. Among the five cohorts, the odds of participating in Year 12 for students whose father was born in a non-English speaking country (relative to non-participating) were between 1.8 and 3.0 times more than for those whose fathers were Australian-born. There is no evidence of a trend over time. There was no significant difference in the odds of students whose father was not born in Australia but born in another English speaking country participating in Year 12 (relative to not participating) compared with students with Australian-born parents.

Region

Non-metropolitan students are less likely to participate in Year 12 compared to metropolitan students (Table 3 and Figure 1). In 1980, 1994 and 1998 the odds of non-metropolitan students participating in Year 12 (relative to non-participating) were between 0.6 and 0.7 times that of metropolitan students. There is no discernible over time trend, although it is clear that the odds of non-metropolitan students reaching Year 12 relative to metropolitan students have not improved since the early 1980s.

Table 4 Net Effects of Occupational Background on Year 12 Participation, 1980-1998

Cohort	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1998*
Parents' Occupation					
Professional	0.98***	1.37***	0.78***	0.63***	0.71***
Managerial	0.59***	0.78***	0.24	0.03	0.43***
Clerical /Personal Service	0.08	0.62***	0.42	0.31*	0.41***
Manual	-	-	-	-	-

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

State or Territory

Generally the effects of State and Territory on Year 12 participation (Table 3) reflect the participation rates of the respective States and Territories (Table 2). However, there are a few differences that can be explained by differences between the States in the distributions of students according to school type, region and other factors. For the 1995 Year 9 cohort, the odds of Year 12 participation for Victorian students was not significantly different from students from New South Wales net of school type and other influences. In contrast, Queensland students show higher odds of Year 12 participation once the effects for region are taken into account.

School Type

School type has a significant influence on reaching Year 12, other factors being equal. In 1998, the odds of students who attended an independent school in Year 9 participating in Year 12 (relative to not participating) were 1.6 times that of students who attended a government school in Year 9. This effect is net of parents' occupation and education and, importantly, achievement test scores.

However, the effect on Year 12 participation of attendance at an independent versus government school was considerably weaker during the late 1990s compared to the 1980s. For the 1961 cohort, the odds of participation (relative to not participating) for independent school students were a massive 9 times that for government school students. The comparable odds for the 1965, 1970 and 1975 cohorts are 7.2, 6.6, and 2.7 further declining to 1.6 for the 1995 Year 9 cohort.

The odds of Year 12 participation for attendance at a Catholic school compared to a government school has fluctuated over the period studied. The YIT cohorts show a decline in the odds ratios between the 1965 and 1975 cohorts. However, in the 1995 Year 9 cohort the odds of students who attended a Catholic school in Year 9 participating in Year 12 were 1.9 times greater than those for students who attended a government school. These odds are greater than those for attendance at an independent school (compared to attendance at a government school), other factors being equal.

Achievement

Not surprisingly, achievement test scores were a strong influence on Year 12 participation during the period studied. An increase of one standard deviation in achievement test score translated to an increase of between 2.0 and 2.9 times in the odds of Year 12 participation, other factors being equal.[9] While the influence of achievement on reaching Year 12 is declining over time, it remains one of the strongest influences.

4. PARTICIPATION IN HIGHER EDUCATION

Patterns of Participation in Higher Education

Table 5 shows participation rates in higher education for the five cohorts. Like the figures for Year 12 participation, the corresponding data for the first four cohorts can be found in LSAY Research Report Number 13 (Long, Carpenter & Hayden, 1999). For these Youth in Transition (YIT) cohorts, the participation rates are, again, measured as participation by age 19. However, for the 1995 Year 9 cohort, a grade-based sample, it is measured by participation in the calender year 1999. Participation in higher education includes participation in both universities and until the late 1980s, the Colleges of Advanced Education (see Appendix 2 for details).

Participation in higher education has grown since the early 1980s, although not as dramatically as participation in Year 12. For the 1961 YIT cohort, the participation rate (by 1980) was around 20 per cent. This rate had risen to 28 per cent (by 1989) for the 1970 cohort and 38 per cent (by 1994) for the 1975 cohort. The 1995 Year 9 cohort shows a participation rate of 31 per cent. This lower participation rate for the youngest cohort is not because participation has declined. It reflects the different sample designs and criteria for assessing participation. However, it is important to note that these differences are unlikely to substantially alter the conclusions about the patterns of participation by social background and other characteristics. Appendix 3 specifically addresses this issue.

Gender

Table 5 shows differential growth in higher education participation rates between males and females. During the 1980s men and women attended higher education at approximately the same rate by age 19. By the mid 1990s, the female university participation rate was 8 percentage points greater than that of males. This gap is slightly higher (at 9 percentage points) for the youngest cohort that entered higher education in 1999.

Socioeconomic Background

Throughout the period studied, parental occupation was associated with participation in higher education. Students from professional backgrounds were far more likely to participate in higher education than students from other occupational backgrounds (especially the semi-skilled manual group). Participation rates are lower for students classified as having a managerial (compared to a professional) background, and this group did not show consistently higher participation rates than those from a clerical or personal service background. Overall, students from manual backgrounds exhibited considerably lower participation rates than students from the three non-manual occupational groups.

Over the period from 1980 to 1999 participation rose by between 1.2 and 1.9 times for students from each occupational group. However, the youngest cohort (participating in 1999) shows a smaller gap in the participation rates between students from professional and manual backgrounds. The participation ratios for students from professional backgrounds relative to unskilled manual backgrounds fluctuated within the five cohorts but suggest an overall decline. The relevant participation ratios (professional relative to unskilled manual backgrounds) are 2.9, 4.2, 2.6, 2.6 for the 1961, 1965, 1970 and 1975 cohorts and 1.9 for the 1995 Year 9 cohort.

As was the case for students from professional families, students whose mothers had a higher education qualification are considerably more likely to participate in higher education. However, there is some evidence of a decline when comparing the cohort born in 1965 with younger cohorts. In the 1965 cohort, the odds ratio for participation between students with and without university educated mothers, was 4.9. For the 1970 cohort this odds ratio was 3.9 and had

declined to 2.5 for the youngest cohorts. Similarly the participation ratio shows a decline from 2.9 for the 1965 cohort, to 2.2 for the 1970 cohort, and to 1.8 for the two youngest cohorts.

Ethnicity

Young people whose fathers were born in a non-English speaking country are more likely to participate in higher education than those from an English-speaking background. The participation ratios between young people with fathers born in non-English speaking countries compared with those with Australian-born fathers do not reveal a trend (at least, among the data from the four YIT cohorts). The participation ratios are 1.4, 1.3, 1.2, and 1.3 respectively. However, the participation ratio (1.5) for 1995 Year 9 cohort may suggest that students from non-English speaking backgrounds are increasingly more likely to participate in higher education than students whose fathers were born in Australia.

Region

Young people in rural areas show lower participation rates in higher education than their urban counterparts. Focusing first on the metropolitan/non-metropolitan distinction the gap has fluctuated throughout the time period studied. The gap was large in the 1961 cohort, much smaller in the 1970 cohort but has increased in the younger cohorts. The quartile measure of population density provides a similar picture with a substantial difference in participation rates for the 1975 cohort in particular (see Appendix 2 for a description of each of these measures).

State or Territory

During the time period investigated, participation rates in higher education differ across the States and Territories. The ACT and Victoria showed higher participation rates than the other States. Tasmania and the Northern Territory showed the lowest participation rates.

School Type

Students who attended independent schools are more likely to participate in higher education. In 1980 students who attended independent schools in their middle schooling (when 10 or 14 years old) were 3.6 times more likely than students at government schools to participate in higher education. However, by 1994 the participation ratio had declined to 2.4 and even further for the youngest cohort (2.0). Differences in participation between students who attended independent and Catholic schools also narrowed, with participation ratios declining from 2.3 for the 1961 cohort to 1.5 and 1.2 for the two youngest cohorts.

Achievement in Literacy and Numeracy

Student achievement is strongly related to participation in higher education. Very few students in the lowest achievement quartile participate in higher education (less than 10 per cent). In contrast, since the late 1980s half or more of the students in the top achievement quartile have participated in higher education.

The very low rates of participation in the lowest quartile produce unstable participation ratios so cannot be used to assess trends over time.[10] Comparison of the second achievement quartile relative to the top quartile produces more stable participation ratios. These participation ratios suggest a decline in the impact of achievement. The respective participation ratios for the YIT cohorts are 4.8, 4.6, 3.1, 3.3 with the ratio for the 1995 Year 9 cohort further declining to 2.6.

Table 5 Participation in Higher Education, 1980-1999, by Cohort and Background (per cent of group)

Cohort Definition	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1999*
Of Total Cohort	20	19	28	38	31
Gender					
Male	20	19	27	34	26
Female	19	18	29	42	35
Parents' Occupation					
Professional	38	42	52	62	47
Managerial	23	24	31	44	37
Clerical /Personal Service	24	20	35	44	32
Skilled Manual	18	13	20	30	22
Semi-Skilled Manual	11	11	20	18	20
Unskilled Manual	13	10	20	24	25
Parents' Education					
Higher Education	37	50	58	62	51
Not Higher Education	19	17	26	34	29
Father's Country of Birth					
Australia	18	18	27	36	28
English Speaking Country	23	17	28	40	29
Non-English Speaking Country	26	23	33	45	41
Region					
Metropolitan	24	20	30	42	35
Non-Metropolitan	13	16	27	32	25
Region (Population Density)					
Most Rural Quartile	15	13	26	28	25
Second Quartile	12	16	22	34	27
Third Quartile	25	21	30	38	33
Most Urban Quartile	27	24	34	52	37
State or Territory					
New South Wales	19	18	28	35	31
Victoria	21	18	30	42	38
Queensland	19	21	29	38	25
South Australia	23	15	26	43	31
Western Australia	19	23	27	37	27
Tasmania	11	9	19	27	20
Australian Capital Territory	32	30	38	46	34
Northern Territory	8	9	24	34	16
School Sector					
Independent	57	55	62	72	49
Catholic	25	22	35	49	40
Government	16	15	21	30	25
Achievement in Literacy & Numeracy					
Highest Quartile	43	41	53	69	55
Third Quartile	19	18	30	38	38
Second Quartile	9	9	17	21	21
Lowest Quartile	5	3	5	6	9

Influences on Participation in Higher Education

In this section we use multivariate analyses to investigate the influences on participation in higher education. We analyse the same model reported in the earlier chapter on Year 12 participation: gender, parental occupation and education, ethnicity, region (metropolitan/non-metropolitan), State (or Territory) of residence, school type, and achievement in literacy and numeracy. The results are reported in Table 6 and Figure 2.

The analysis was performed using logistic regression and the results are reported in the text as odds ratios. The odds ratios for selected social background and school characteristics are presented in graphical form in Figure 2. This graph gives a clearer picture of the relative strength of influences and trends over time.

Gender

The results in Table 6 show that gender has grown in importance as an influence on participation in higher education, other factors being equal. In the 1980s, the odds of participating in higher education (relative to not participating) were much the same for young men and young women. However, in the 1990s gender had become a significant influence, with the odds of participation/non-participation in higher education for young women about 2 times greater than that for young men.

Socioeconomic Background

Because of the high correlation between parents in the professional occupational group and parents with tertiary qualifications, the estimates for these variables in Table 6 cannot be readily interpreted. The estimates for the occupational categories obtained from an analysis without parents' education (but with all the other measures) are presented in Table 7 (and Figure 2).

The odds of students from professional backgrounds participating in higher education (relative to not participating) are substantially greater than the corresponding odds for students from manual backgrounds. This effect appears to be declining since the mid-1980s. For the 1965 cohort the professional/manual background odds ratio was 3.5, 3.2 for the 1970 cohort, and 2.8 for the 1975 cohort. In the youngest cohort the odds ratio had declined to 2.1, an odds ratio almost comparable with that for gender.

The effects of a managerial or clerical occupational background (relative to a manual background) on participation in higher education are significant but weaker than the effects for professional background, and show no clear trends in their relative impact.

Ethnicity

The odds of students whose father was born in a non-English speaking country participating in higher education (relative to not participating) are 2.1 to 2.8 greater than the odds for students whose father was born in Australia. This difference has been relatively constant since the mid-1980s.

For the four youngest cohorts, there are no significant differences in participation in higher education for students whose fathers were born in English-speaking countries compared with students with Australian-born fathers.

Table 6 Effects on Participation in Higher Education, 1980-1999

Cohort	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1999*
Intercept	-2.23***	-2.38***	-1.84***	-1.98***	-1.96***
Gender					
Male	-	-	-	-	-
Female	0.03	-0.16	0.03	0.71***	0.61***
Parents' Occupation					
Professional	0.72***	1.06***	0.96***	0.94***	0.67***
Managerial	0.30*	0.44**	0.11	0.67***	0.47***
Clerical /Personal Service	0.32*	0.28	0.45	0.63***	0.37**
Manual	-	-		-	-
Parents' Education					
Higher Education	0.40*	0.78***	1.14***	0.47***	0.39***
Not Higher Education	-	-	-	-	-
Father's Country of Birth					
Australia	-	-	-	-	-
English Speaking Country	0.58**	0.09	0.16	0.01	-0.02
Non-English Speaking Country	1.04***	0.86***	0.77***	0.86***	0.76***
State or Territory					
New South Wales	-	-	-	-	-
Victoria	0.06	-0.08	-0.46**	0.41**	0.35***
Queensland	0.13	-0.03	-0.57**	0.26	0.18
South Australia	0.29	-0.35	-0.47	0.52**	0.03
Western Australia	0.08	0.16	-0.63*	0.11	-0.18
Tasmania	-0.35	-1.09**	-0.90*	-0.14	-0.16
Australian Capital Territory	0.17	0.21	-0.55	-0.36	-0.30
Northern Territory	0.35	-0.21	-0.85	0.48	-0.55
Region					
Non-Metropolitan	-0.55***	-0.01	0.17	-0.37**	-0.19**
Metropolitan	-	-	-	-	-
School Sector					
Independent	1.18***	1.34***	1.74***	0.87***	0.37**
Catholic	0.42**	0.42**	0.60***	0.48***	0.41***
Government	-	-	-	-	
Achievement (Standardised)	1.22***	1.29***	1.57***	1.47***	0.97***

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

Table 7 Net Effects of Occupational Background on Participation in Higher Education, 1980-1999

Cohort	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1999*
Parents' Occupation					
Professional	0.81***	1.25***	1.15***	1.04***	0.75***
Managerial	0.32***	0.50***	0.20	0.70	0.49***
Clerical /Personal Service	0.38**	0.29***	0.52**	0.62**	0.37***
Manual	-	-	-	-	-

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

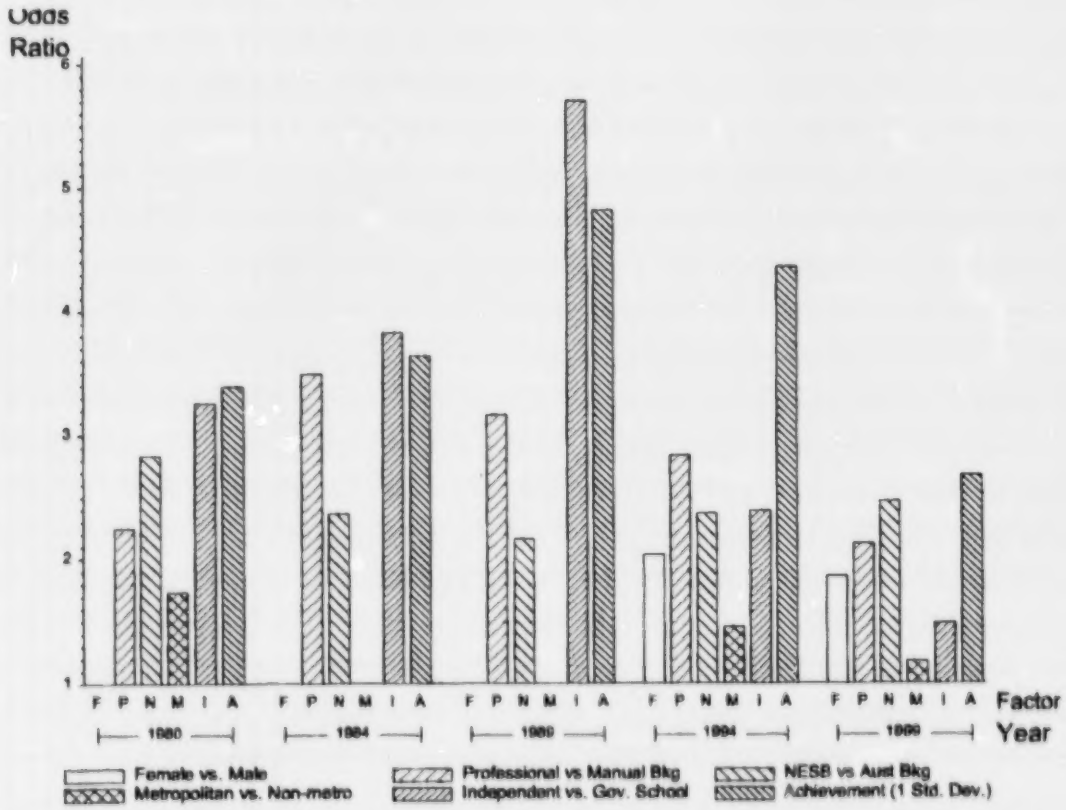

Figure 2 Effects of Selected Social Background and School Factors on Participation in Higher Education, 1980-1999

School Type

The influence of school system on the likelihood of participating in higher education has fluctuated somewhat over the period between 1980 and 1999. However, the odds of participating in higher education have been consistently greater for Catholic and independent school students than for government school students, other factors being equal. For Catholic school students the odds are between 1.5 to 1.8 times greater than that for government school students. The odds ratios of participation in higher education (relative to non-participation) for students from Catholic schools compared to government school students appear to have declined since the late 1980s.

There is little doubt that there is a decline in the odds of students from independent schools participating in higher education (relative to not participating) compared to students who attended a government school. For the four YIT cohorts the odds ratios were 3.3, 3.8, 5.7 and 2.4 respectively, declining to 1.4 for the 1995 Year 9 cohort (see Figure 2).

Achievement in Literacy and Numeracy

Students' achievement in school has a significant influence on whether or not they will participate in higher education. Over the period studied, an increase of one standard deviation in achievement meant an increase in the likelihood of participating in higher education of between 2.6 and 4.8 times (see Figure 2). Therefore, in 1999 students whose achievement in Year 9 was one standard deviation above the mean were 7.0 times more likely to participate in higher education than those one standard deviation below the mean, net of other factors. The effects of achievement are large and very strong in the 1970 and 1975 cohorts, other factors being equal. While its effect is considerably weaker in the 1995 Year 9 cohort, it remains a very important influence on higher education participation.

5. KEY ISSUES

The previous chapters of the report have provided an update of prior reports on the influence of background characteristics on participation in education. In this chapter we examine a number of key policy issues surrounding participation in Year 12 and higher education in further detail: rurality; ethnicity; being an Indigenous student; cultural and economic aspects of socioeconomic background; changes in the effects of socioeconomic background over time; part-time work; and the role of individual schools. The final part of this chapter investigates the role of psychological factors in participation, specifically engagement, self-concept of ability, and student and parental aspirations. This examination of contemporary issues focuses mainly on the 1995 Year 9 cohort since this cohort provides the richest and most up-to-date data.

Rurality

A contemporary issue in Australian society is the lack of resources and opportunities for those living in rural areas. In the context of education, students in rural areas may not enjoy the same quality or quantity of educational resources as students attending schools in metropolitan areas.

It is clear from the preceding chapters that students in non-metropolitan areas or areas with low population densities are less likely to reach Year 12 and participate in higher education. However, the effects of rurality on educational participation are not particularly strong. The correlations between the quartile population density measure used in the earlier analysis and participation in Year 12 and higher education are 0.13 and 0.11, respectively. The relationship is in the expected direction but is weaker than the effects of other factors such as socioeconomic status and gender (see Tables 3 and 6).

Further analysis using alternative measures of rurality was conducted in order to address the following issues. First, it may be the case that the weak relationship between rurality and participation is an artefact of the measures used; that is, the quartile population density measure may be inadequate and an alternate measure may reveal a stronger underlying relationship between rurality and participation. Second, different measures also allow researchers to explore the nature of urban and rural differences. For example, is it the case that young people in very remote areas are more disadvantaged than young people in regional areas in terms of educational participation? Alternatively, is the important distinction between young people living in the major cities and other young people?

There are a variety of ways to measure rurality: the size of place in which the student lives; the population density of the Census district or postcode of the student's residence; or simply distinguishing between metropolitan and non-metropolitan students. The data from the Year 9 1995 cohort are particularly well placed to investigate the relationship between rurality and educational participation. A total of five urban/rural measures were constructed, each based upon home address in 1995 of the Year 9 1995 cohort.

The first is simply a dichotomous measure, distinguishing metropolitan (lives in a place with 100,000 or more persons) from non-metropolitan. This measure was used in earlier analyses. The second measure relates to the first but distinguishes between students living in rural and remote areas (<1000 persons). The other three measures are based on population densities. The first is based on quartiles of Local Government Areas (LGAs) arranged from the LGA most sparsely populated to that most densely populated. Therefore the sparsest 25 per cent of LGAs make up the first quartile; the next 25 per cent make up the second quartile and so on. The second of these measures is based on postcodes rather than LGAs. The last quartile measure is constructed as quartiles of the distribution of individuals (assigned the population density of their Census District), rather than the distribution of geographical areas. Only in this measure does each quartile comprise approximately the same number of individuals.

Table 8 Participation in Year 12 (1998) and Higher Education (1999) by Different Rural-Urban Measures, Year 9 Cohort of 1995

Measure of Rurality	Per cent participation in Year 12	Per cent participation in higher education
Metropolitan/Non-Metropolitan		
Non-Metropolitan (< 100,000)	71	25
Metropolitan (over 100,000)	82	35
Size of Place		
Remote (<1,000)	69	23
Regional (1,000-99,000)	73	27
Metropolitan (over 100,000)	82	35
Population Density (Quartiles of Local Government Areas)		
1st quartile: <1.8 persons per sq km	73	27
2nd quartile: 1.8<28.6 persons per sq km	70	24
3rd quartile: 28.6<870 persons per sq km	75	26
4th quartile: >870 persons per sq km	82	36
Population Density (Quartiles of Postcodes)		
1st quartile: 1-4 persons per sq km	71	26
2nd quartile: 5-24 persons per sq km	71	24
3rd quartile: 25-499 persons per sq km	74	27
4th quartile: 500 plus persons per sq km	82	35
Population Density (Quartiles of Individuals – assigned Census District population densities)		
1st quartile: <35.2 persons per sq km	71	25
2nd quartile: 35.2 – 736.5 persons per sq km	74	27
3rd quartile: 736.5 – 1611.4 persons per sq km	81	34
4th quartile: >1611.4 persons per sq km	83	37

The proportion of the Year 9 1995 sample reaching Year 12 or higher education according to the different urban/rural measures is presented in Table 8. Several conclusions can be drawn from these data. First, no matter what urban/rural measure is used there is about a 10 percentage point difference in participation (in either Year 12 or higher education) between the most urban and most rural groups. Second, there is no evidence that young people attending school in the most remote areas are substantially less likely to participate in Year 12 and higher education compared to young people in slightly less remote areas. Finally, the major difference is between the 55 per cent of students living in metropolitan areas and the rest who live in non-metropolitan areas.

Ethnicity

Over the last three decades a major policy focus has been the educational disadvantages experienced by students with language backgrounds other than English. Since English is the language of instruction and the dominant societal language, it is reasonable to suppose that students from backgrounds other than English would be at a severe disadvantage. On the other

hand, from a historical perspective, migrant families have tended to emphasise their children's education as the key to a better life so that their educational performance is much higher than for non-migrant children.

Earlier in this report, it was found that participation rates (for both Year 12 and higher education) for students whose fathers were born in a non-English speaking country are higher than for students whose fathers were born in Australia. This difference remained substantial and significant after controlling for occupational and educational background. One response to these findings is that the category 'Non-English Speaking Backgrounds' is too broad to be useful and includes some ethnic groups whose participation rates are substantially below average, therefore obscuring evidence of disadvantage. Although this is possible, these groups are unlikely to be numerous or large since the low participation rates of these groups would need to be balanced by exceptionally high participation rates of students from other ethnic groups, so that the overall average is higher than that for the comparison group.

In order to compare participation rates across ethnic groups, a more detailed measure was constructed. This measure distinguished students whose fathers were born in Australia, another English speaking country (mainly the United Kingdom), Southern Europe, other European countries, Asia, the Middle East and North Africa, other countries in Africa, Central and South America, and the Pacific (not including New Zealand). Details on the grouping of countries are provided in Appendix 2.

Table 9 Participation in Year 12 (1998) and Higher Education (1999) by Father's Country of Birth, Year 9 Cohort of 1995

Father's Country of Birth	Per cent participation in Year 12	Per cent participation in higher education
Australia	74	28
English-speaking country	76	29
Southern Europe	81	32
Other Europe	77	33
Asia	91	60
Middle East & North Africa	85	37
Other Africa	89	49
Central and South America	88	35
Pacific Islands	88	33

Table 9 presents the participation rates by the disaggregated measure of father's country of birth. The participation rates for students whose fathers were born in non-English speaking countries are higher than for students whose fathers were born in Australia. In several instances the participation rates are substantially higher. For example, the participation rate for higher education of the 'Asia' group is 60 per cent compared to the overall participation rate of around 30 per cent. Similarly, 89 per cent of students classified as 'Other Africa' participated in Year 12 and 49 per cent were participating in higher education in 1999. Students whose fathers were born in other English speaking countries or 'Other Europe' show comparable participation rates.

Since the participation rates for each group of students whose fathers were born in a non-English speaking country are higher than the 'Australia' group, it appears that there is no evidence that, in general, these students are disadvantaged in terms of educational participation. Groups that may have been expected to have relatively low participation rates such the 'Southern Europe', 'Middle East and North Africa', 'Other Africa', and 'Central and South America' groups actually display higher participation rates, and in some cases substantially higher. However, it can be argued that

the nine categories in Table 9 may hide small ethnic groups that do experience low participation rates. A more disaggregated measure may identify such groups.

In Table 10 we present the participation rates for students whose fathers were born in Greece, Italy, the former Yugoslavia, Lebanon, Malta and Vietnam. These groups were chosen on the basis of two considerations: (i) the existence of debates about educational disadvantage for these ethnic groups; and (ii) the groups comprise sufficient numbers of students to provide reasonable estimates of participation. The Year 12 participation rate of each of these groups is higher than the group of students with Australian-born fathers (74 per cent). For participation in higher education, the 'Malta' group shows a lower participation rate, and the other groups show higher participation rates than the 'Australian-born fathers' group (28 per cent). The result for students with Maltese backgrounds provides evidence of disadvantage. With a bigger sample size it may be possible to identify other ethnic groups with participation rates lower than average. However it should be kept in mind that the greater bulk of students with parents born in non-English speaking countries do have higher participation rates than that for the overall student population.

Table 10 Participation in Year 12 (1998) and Higher Education (1999) by Father's Country of Birth for Selected Countries, Year 9 Cohort of 1995

Father's Country of Birth	Per cent participation in Year 12	Per cent participation in higher education
Greece	82	39
Italy	81	33
Former Yugoslavia	78	36
Lebanon	80	33
Malta	78	22
Vietnam	93	57

It may be argued that the higher than average participation rates for students from some immigrant groups can be attributed to their higher than average socioeconomic status. In recent years Australia's immigration program has admitted a higher proportion of more highly educated immigrants and business immigrants. An alternative hypothesis is that the higher participation rates of students in some of these groups are simply a reflection of their higher academic achievement, rather than a result of cultural factors.

Therefore the next step in these analyses was to control for the students' achievement and socioeconomic background. Table 11 presents the results of this analysis. Strong effects of father's region of birth, net of socioeconomic background and achievement, were found. For students with fathers born in southern Europe, the odds of participation (relative to non-participation) in Year 12 and higher education were 2.2 and 1.9 times higher, respectively, than those for students whose fathers were born in Australia. The comparable odds ratios for students from an Asian background were 4.8 and 5.6 and for students in the 'Middle East or North Africa' group the odds ratios were also high. There was no statistically significant effect for the 'other Europe', 'other Africa', and 'Central and South America' groups.

Table 11 Effects of Father's Country of Birth on Participation in Year 12 (1998) and Higher Education (1999), Year 9 Cohort of 1995

Explanatory Variable	Effects on participation in Year 12	Effects on participation in higher education
Intercept	1.18**	-1.31***
Achievement in Literacy & Numeracy	0.73***	1.06***
Gender		
Male	-0.61***	-0.59***
Female	-	-
Occupational Background		
Professional	0.82***	0.87***
Managerial	0.47***	0.55***
Non-Manual	0.42***	0.39***
Manual	-	-
Father's Country of Birth		
Australia	-	-
English Speaking Country	0.08	-0.02
Southern Europe	0.78***	0.66***
Other Europe	0.07	0.09
Asia	1.57***	1.72***
Middle East & North Africa	1.99***	1.57***
Other Africa	0.80	0.62
Central and South America	1.91	0.62
Pacific Islands	0.94*	0.90***

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

The strong effects for students whose fathers were born in some non-English speaking countries suggest that cultural factors are involved leading to higher levels of participation. The higher participation rates experienced by these groups cannot be explained by socioeconomic background nor school achievement.

Indigenous Students

The educational participation of Australia's Indigenous population is an issue high on the political agenda. Since education is an important influence on social and economic outcomes among adults, higher levels of educational attainment of the Indigenous peoples would be likely to reduce social inequities. However, the evidence suggests that the participation rate of Indigenous Australians is very much lower than for non-Indigenous students.

The most thorough examination of the educational participation of Indigenous students is the recent report on the school to work transition of Indigenous Australians by Long, Frigo and Batten (1999). They estimate the Year 8 to Year 12 school retention rate for 1997 at 31 per cent for Indigenous Australians compared to 73 per cent for non-Indigenous Australians (p. 37). Turning to higher education, in 1996 approximately 11 per cent of non-Indigenous 20 to 24 year-olds held a university degree compared to 2 per cent of 20 to 24 year-old Indigenous Australians (p. 76).

Table 12 Participation in Year 12 (1998) and Higher Education (1999) by Indigenous Students, Year 9 Cohort of 1995

	Per cent participation in Year 12	Per cent participation in higher education
All Indigenous students	47	17
Males	48	18
Females	46	16

In the rest of this section, the 1995 Year 9 sample is utilised to examine some of the issues surrounding the educational participation of Indigenous students. In the original sample there were 385 Indigenous students. Of these students, 204 were surveyed in 1998 and 172 were surveyed in 1999. From these data, the Year 12 participation rate for Indigenous students is estimated to be around 47 per cent, adjusting for attrition. The participation rate for Indigenous students was similar for males and females (Table 12).

This Year 12 participation rate of 47 per cent is higher than the Year 9 to Year 12 retention rate of 34 per cent (in 1997) found by Long, Frigo and Batten (1999:33). The original 1995 LSAY sample did not include students who were enrolled but who were absent from school on the day of data collection. Absenteeism is higher among Indigenous students. The Indigenous students present for testing and data collection are likely to be more connected to school, and thus more likely to participate in Year 12 and further education. Students absent from schools are more likely to be boys and students attending schools in rural or remote areas.

These participation rates are very low. The Year 12 participation rate of 47 per cent is lower than all other social and education groups analysed (see Table 2) and the higher education participation rate of 17 per cent is only higher than that for students in the lowest quartile of achievement (see Table 5). The participation ratios (non-Indigenous to Indigenous) are similar for both forms of education: 1.6 for Year 12; and 1.8 for higher education.

The next step is to investigate to what extent the low participation rates among Indigenous students can be attributed to their performance in Year 9 achievement tests and their socioeconomic background. These analyses are reported in Table 13.

The unadjusted odds ratio shows that non-Indigenous Year 9 students are 3.8 times more likely to reach Year 12 (than not reach Year 12) compared to Indigenous students. Controlling for socioeconomic background makes little difference; the odds ratio declines marginally to 3.7. Controlling for literacy and numeracy achievement in Year 9 substantially reduces the odds ratio to 2.7. This means that differences in achievement at school between Indigenous and non-Indigenous students account for a large part of the difference in participation, but the differences remain substantial.

For participation in higher education, achievement plays a larger role. The unadjusted odds ratio for non-Indigenous compared to Indigenous students is considerably lower for higher education (2.2) than for Year 12 (3.8) (derived from Table 13). Controlling for socioeconomic background reduces this effect to 1.8, while controlling for achievement reduces the effect to 1.3. The effect for being an Indigenous student remains significant when controlling for socioeconomic background, but is no longer statistically significant when controlling for achievement in literacy and numeracy. This suggests that improving achievement at school for Indigenous students would be reflected in increased participation of Indigenous students in higher education.

Table 13 Effects of being an Indigenous Student on Participation in Year 12 (1998) and Higher Education (1999) with and without Controls for Parental Occupational Status and Achievement, Year 9 Cohort of 1995

Explanatory Variables	Effects of Indigenous status on participation in Year 12	Effects of Indigenous status on participation in higher education
Indigenous Status	-1.33***	-0.78***
Indigenous Status, Parental Occupational Status	-1.31***	-0.57**
Indigenous Status, Achievement	-1.00***	-0.26
Indigenous Status, Parental Occupational Status, Achievement	-1.03***	-0.15

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

These analyses are preliminary and need to be substantiated by similar analyses using other data, preferably with a larger sample size. However, it is likely that the importance of achievement at school on the educational participation of Indigenous students in Year 12 and especially higher education will be supported by future studies.

Socioeconomic Background

There is a continuing debate about the relative strength of different aspects of socioeconomic background on educational outcomes. Generally there are two arguments as to why young people from less privileged backgrounds generally have poorer educational outcomes. The first focuses on financial resources such as wealth and income. This approach contends that better educational outcomes can be bought through private education, private tutoring, textbooks, and other educational resources. Similarly, the argument runs, students from lower socioeconomic backgrounds perform less well at school because their parents cannot afford educational necessities. The second approach emphasises cultural factors such as the way in which the parents convey positive values to their children about education, time spent helping with children's school work, role modelling, and other attitudinal and behavioural patterns that are likely to improve student learning and interest in continuing with education.

Much research on educational inequalities focuses on cultural factors. Concepts such as cultural capital and social capital are used to explain differential participation in education by socioeconomic background. Cultural capital emphasises how the education system rewards students from the dominant culture, who have attitudes and behaviours that are more acceptable to educational gatekeepers (Bordieu, 1973; DiMaggio, 1982). Social capital emphasises the family and social networks that help (or hinder) a student's educational performance (Coleman, 1988).

A recent Australian publication has claimed that income has a more important influence on university participation in Australia than generally believed (Birrell et al, 2000). The argument that income is especially important is relevant to governments, which can provide financial aid to students who are financially disadvantaged.

Table 14 Effects of Economic and Cultural Aspects of Socioeconomic Background on Participation in Year 12, Year 9 Cohort of 1995

Explanatory Variables	Participation in Year 12		Participation in higher education	
	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate
Model 1				
Intercept	0.30***		-1.88***	
Parents' Wealth	0.16***	0.15	0.17***	0.16
Parents' Education	0.71***	0.17	0.84***	0.20
Model 2				
Intercept	0.79***	-	-1.63***	-
Parents' Wealth	0.10***	0.10	0.11***	0.10
Parents' Education	0.53***	0.12	0.57**	0.13
Achievement in lit. & num.	0.62***	0.32	0.91***	0.46

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

Using data collected from the 1995 Year 9 cohort we are able to investigate the effects of wealth and parental education which is often viewed as a surrogate measure of cultural capital (Paterson, 1991). Comparisons of the correlations suggest that cultural factors are more important. The correlation between wealth and participation in higher education is 0.15, compared to 0.21 for parents' education.

Given that parental wealth and parental education are correlated, the bivariate correlation between parental education and participation includes that part of parental education correlated with wealth and correspondingly, the bivariate correlation between wealth and participation includes that part of wealth correlated with parental education. Multivariate analysis allows the researcher to disentangle the effects of variables, removing that part of the variable correlated with other variables. The multivariate analysis (presented in Model 1, Table 14) also suggests that while both cultural factors and wealth influence participation, cultural factors are more important. For participation in Year 12, the standardised effects of parents' education and wealth are 0.17 and 0.15 respectively. For participation in higher education, the standardised effects for parents' education and wealth are 0.20 and 0.16 respectively.[11]

It should be kept in perspective that the effects of these two socioeconomic factors on participation are considerably weaker than the effect of school achievement. School achievement, measured by students' performance in literacy and numeracy in Year 9, has a standardised effect of 0.32 on participation in Year 12 and 0.46 on participation in higher education (Model 2, Table 14).

Returning to the recent report on the effects of occupation and income on participation (Birrell et al., 2000), it should be noted that the results of the analysis of Australian census data on the relationship between occupation and university participation are comparable to those found in the survey data analysed in this report. According to Table 3 (p. 56) of the Birrell article, 37 per cent of 18-19 year olds who were living at home and from professional families were dependent students. The figures for youths from managerial, clerical, trades and labouring families were 30, 22, 18 and 14 per cent, respectively. These participation ratios are broadly comparable with the participation ratios calculated from the data presented in Table 5 of this report, even though there are considerable differences in sampling and measurement between the two studies.

Changes over Time in the Influence of Socioeconomic Background

An important policy issue is whether the impact of socioeconomic background on educational outcomes is declining. If it is declining, then progress is being made in reducing social inequality. However, if its influence is found to be stable or increasing over time then policy makers need to reassess policies aimed at reducing social inequality.

The results presented earlier in this report do suggest there has been a decline in the effect of parental occupation and education on educational participation by young people. However, this conclusion is strongly influenced by the patterns of participation in the 1995 Year 9 cohort. The patterns found in the four Youth in Transition (YIT) cohorts provide some support, although weaker, for the decline hypothesis. In this section we perform two simple tests to further investigate if socioeconomic background has become a less important influence on participation.

We test for a decline in the influence of socioeconomic background on participation, focusing only on participation in higher education, since socioeconomic differences in Year 12 completion have become a less prominent issue due to high Year 12 participation rates. For the first test, we employ a simple model of participation comprising only parental occupation and achievement. It is important to focus on the effect of socioeconomic background on participation independent of student achievement, as achievement and socioeconomic background are correlated to some extent.[12] There is no need to control for school type, parental education or other socioeconomic factors because we are interested in the overall effect of socioeconomic background on participation. If the decline hypothesis is correct then the effects of occupational background should be smaller among the younger cohorts.

The second test calculates the predicted probabilities for two groups of students using the simple model of occupational background and achievement. Both groups have achievement levels one standard deviation above average; one group comprises students from a professional background and the other group comprises students from a manual background. If the decline hypothesis is correct then the differences in the predicted probabilities of participating in higher education should narrow over time. A variety of other comparisons of predicted probabilities can be made but this comparison is arguably the most relevant to the 'decline' debate.

The results of this exercise are presented in Table 15. It is clear that the effects of a professional background on participation in higher education compared to a manual background have declined. The odds ratio declines from nearly 4 for the 1965 and 1970 cohorts to an odds ratio of 3.0 for the 1975 cohort; declining further to 2.2 for the 1995 Year 9 cohort.

The predicted probabilities also lend support to the decline thesis. The gap in predicted probabilities between the two groups has declined since the mid 1980s. This result is confirmed with both the participation ratios and odds ratios. Therefore these data do provide evidence that there has been a decline in the effects of parental occupation on participation in higher education.

Table 15 Effects of Occupational Background and Achievement on Participation in Higher Education, 1980-1999

Cohort	Born in 1961	Born in 1965	Born in 1970	Born in 1975	Year 9 in 1995
Year Participation Measured	*1980*	*1984*	*1989*	*1994*	*1999*
Estimates					
Intercept	-1.88***	-2.16***	-1.54***	-1.15***	-1.28***
Parents' Occupation					
Professional	0.92***	1.34***	1.35***	1.14***	0.78***
Managerial	0.23	0.57***	0.41	0.75***	0.48***
Clerical /Personal Service	0.38*	0.35	0.51	0.66***	0.34***
Manual	-	-	-	-	-
Achievement (Standardised)	1.17***	1.30***	1.38***	1.32***	0.96***
Predicted Probabilities of Participating in Higher Education					
Manual background, one standard deviation above the mean in achievement	0.32	0.30	0.46	0.54	0.42
Professional background, one standard deviation above the mean in achievement	0.56	0.62	0.77	0.78	0.61
Participation Ratio (of Predicted Probabilities)	1.75	2.07	1.67	1.44	1.45
Odds Ratio (of Predicted Probabilities)	2.7	3.8	3.9	3.0	2.2

Note: Unstandardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

Part-Time Work

Employment during secondary school may help or hinder participation in education. On the one hand, the extra income could allow some students greater access to education. Alternatively part-time work may encroach on study time, leading to poorer results and increasing the chances of leaving school before Year 12. Part-time work could also provide students with a pathway to leave school and enter the workforce. These issues were investigated by Robinson (1999) using the 1975 YIT cohort who reached Year 12 around 1993.[13] She found that although part-time work during Year 11 had no effect on school completion, there was a weak negative relationship between working more than 10 hours per week and participation in Year 12. Robinson hypothesised that this relationship could be indicative of reduced attachment to school.

In this section we investigate the effect of part-time work on educational participation for the 1995 Year 9 cohort. In Year 11 approximately 42 per cent of students had part-time jobs. In Year 12 about 48 per cent had part-time jobs. Most students work part-time only for a small number of hours per week. In both Years 11 and 12, nearly a quarter worked 6 hours a week or less, and around 75 per cent worked 12 or less hours per week.

The analysis presented in Table 16 suggests that part-time work in Year 11 has little or no effect on Year 12 participation, net of other factors. The odds of participation in higher education (relative to non-participation) were 1.3 times higher for students who did not work part-time in Year 12 compared to those who worked part-time. Additional analysis (not reported here) suggests that working part-time for extensive periods of time in Year 12 is detrimental to participation in higher education.

Table 16 Effects of Part-time Work on Participation in Year 12 and Higher Education, Year 9 Cohort of 1995

Explanatory Variables	Year 12 (At school in Year 11) Unstandardised estimate	Year 12 (At school in Year 11) Standardised estimate	Higher education (At school in Year 12) Unstandardised estimate	Higher education (At school in Year 12) Standardised estimate
Intercept	1.69***		-1.29***	
Gender				
Male	-	-	-	-
Female	0.53***	0.14	0.50***	0.14
Parents' Occupation				
Professional	0.60***	0.14	0.63***	0.15
Managerial	0.38***	0.09	0.40**	0.09
Non-Manual	0.26*	0.05	0.27**	0.05
Manual	-	-	-	-
Father's Country of Birth				
Australia	-	-	-	-
English Speaking Country	-0.22	-0.04	-0.09	-0.02
Non-Eng. Spkg. Country	0.48***	0.11	0.69***	0.16
Region				
Metropolitan	-	-	-	-
Non-Metropolitan	-0.36***	-0.09	-0.16**	-0.04
School Sector				
Government	-	-	-	-
Catholic	0.79***	0.18	0.30***	0.09
Independent	0.48***	0.09	0.42***	0.10
Achievement (standardised).	0.54***	0.27	0.94***	0.46
Part-time Work in Year 11	0.05	0.36		
Part-time Work in Year 12			-0.25***	-0.07

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

The Effect of Schools

In this section we examine the effects of individual schools on participation in Year 12. The popular image is that some schools deliver particularly good education outcomes while other schools perform worse than the norm. However, it is possible that the differences between such schools can be attributed to the social and academic mix of students in these schools. For an individual school to be performing particularly well, it would need to deliver educational outcomes superior to that which are expected given the social and academic mix of its students. Similarly for a school to be judged as performing particularly poorly, it would be delivering poorer educational outcomes than expected. In this section we investigate the extent to which individual schools contribute to participation in Year 12 over and beyond what is expected given the norms for the schools' State or Territory, and the achievement levels of its students.

The focus is on the influence of individual schools in Year 9 on subsequent Year 12 participation. Decisions about participation in Years 11 and 12 are made largely in Years 9 and 10, usually by students and their parents in consultation with the school. Therefore, it is logical to focus on the school students attended in Year 9. In some school systems it is not possible to continue from Year 9 to Year 12 in the same school. For example in both Tasmania and the ACT, government school students undertake Years 11 and 12 at a separate college or senior secondary school. In addition there is some movement between systems and schools between Years 9 and 12. For the analysis of the effect of individual schools there are two alternatives: remove from the analysis all students who moved school; or retain them. The decision was made to keep 'movers' in the analysis since the focus is on the role individual schools play in Year 9 on participation in Year 12.

This examination was performed using the 301 schools that were sampled for the 1995 Year 9 survey. Hierarchical or multilevel modelling was used, with students at the first level and schools at the second level. The analysis involves quantifying the number of schools that show significantly different rates of Year 12 participation with and without explanatory controls. The results are summarised in Table 17.

Table 17 Percentage of Schools whose Year 9 Students' Year 12 Participation Rates were Significantly Different from Expected, Year 9 Cohort of 1995

Controls	Percentage of schools
None	31
State/Territory	26
State/Territory, School Achievement	17
State/Territory, School Achievement, School Type	12

Taking into account the clustering of students in schools, the average Year 12 participation rate was estimated at 77 per cent, very close to the estimate using individual students reported earlier. The school Year 12 participation rates range from a low of 25 per cent to a maximum of 95 per cent. Of the 301 schools in the sample, 207 had Year 12 participation rates close to that of the mean participation rate. That is, there was no statistically significant difference between the rates of Year 12 participation in these schools compared to the mean participation rate. The remaining 31 per cent of schools showed Year 12 participation rates significantly lower or higher than the mean participation rate.

Since the different Australian States and Territories have, to some extent, different school structures and programs, one possible explanation for the differences in participation rates is the State or Territory in which the school is located. Historically some States and Territories have had much higher participation rates than others. When 'State or Territory' was included in the model, it was found that 78 schools (or 26 per cent) had participation rates significantly different from their mean State/Territory participation rates. This is a decline from the 31 per cent of schools obtained before controlling for State/Territory differences.

Another possible explanation for the range of Year 12 participation rates is that they reflect the achievement levels of the students in different schools. When achievement was added to the analysis, 51 schools (17 per cent) had Year 12 participation rates significantly different from what is expected given the schools' State or Territory and the academic mix of the students. Of these 51 schools, 33 had Year 12 participation rates significantly lower than what was expected. Therefore we estimate that in approximately 11 per cent of schools, their Year 9 students' subsequent Year 12 participation is less than expected given the State or Territory in which the school is located and the academic mix of the students. Similarly, for 6 per cent of schools the participation rate is higher than expected.

It could also be argued that school type is a factor that contributes to Year 12 participation. Our earlier analyses showed that Year 12 participation differs between school sectors, although less so now than during the 1980s. Independent schools have historically had high rates of Year 12 participation; it is the 'norm' for their students to reach Year 12. This is less true of schools in the Catholic system. Students from independent and Catholic schools show higher rates of Year 12 participation than those in the government sector. Therefore, the next step in the analysis is to include a measure of school type. The addition of this measure reduced the percentage of schools that show statistically significant variation from their expected rates of Year 12 participation to 12 per cent. Therefore, 88 per cent of schools display Year 12 participation rates that are expected given State/Territory, school type, and the academic mix of students. Of the 12 per cent of schools that show unexpected Year 12 participation rates, 21 (or 7 per cent) show Year 12 participation rates significantly below expected levels.

The conclusion from these analyses is that in the great majority of schools, Year 12 participation does not vary significantly from what is expected, given State or Territory, school type and the academic mix of students. Socio-cultural factors such as school climate are likely to be involved in the 12 per cent of schools which show either higher or lower than expected Year 12 participation rates.[14] This finding does not mean there are no schools performing particularly well or particularly poorly in regard to Year 12 participation rates, but there are fewer of them than generally believed. The major caveat surrounding these analyses is that they are based on a small number of schools, each with only a sample of students. Analysis of a larger number of schools and students would provide firmer evidence on the role of individual schools in Year 12 participation.

Psychological Factors

The socioeconomic influences discussed above only account for a small proportion of variance in educational participation. About 14 per cent of the variation in Year 12 participation is accounted for by the core model (comprising achievement, gender, occupational background, region, school type and father's birthplace).[15] This leaves a substantial amount of unexplained variance. One area often neglected in studies of educational outcomes is the role of psychological factors. Attitudes, motivations and aspirations may influence participation, in addition to sociodemographic and educational influences. In this section we examine the effects of engagement with school, academic self-concept, educational aspirations and parental expectations on participation in Year 12, net of the influence of sociodemographic and educational factors.

Engagement in School Life

Engagement in school life has been suggested as a critical factor in determining whether or not students complete school. In this analysis we define engagement as Finn's (1989) highest level: participation in the school beyond the classroom, such as membership of clubs, sports teams and student leadership. In Finn's model, participation (and success) in school activities leads to identification (defined as a sense of belonging), which in turn influences participation.

Alternatively, higher levels of engagement could have an adverse impact on educational participation by reducing the time students study. However, most of the literature (which is largely from the United States) views engagement as a positive influence on remaining at school. Conversely, early school leaving has been linked to lower participation in extra-curricular activities (Ekstrom, et al., 1986). A meta-analysis of research on extra-curricular activities (Holland & Andre, 1987) suggests that participation is also associated with other positive outcomes, such as higher levels of self-esteem, educational aspirations and self-efficacy. Thus, it could be through these, and similar psychological factors, that the process of identification occurs.

Table 18 The Effect of Engagement in School Life on Participation in Year 12, 1998

Explanatory Variables	Core Model		Core + Engagement	
	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate
Intercept	0.75***		0.47***	
Gender				
Male	-	-	-	-
Female	0.62***	0.17	0.49***	0.13
Parents' Occupation				
Professional	0.69***	0.16	0.69***	0.16
Managerial	0.41***	0.09	0.35***	0.08
Non-Manual	0.39***	0.07	0.44***	0.08
Manual	-	-	-	-
Father's Country of Birth				
Australia	-	-	-	-
English Speaking Country	-0.00	0.00	0.06	0.01
Non-English Spkg Country	0.62***	0.14	0.83***	0.19
Region				
Metropolitan	-	-	-	-
Non-Metropolitan	-0.47***	-0.13	-0.41***	-0.11
School Type				
Government	-	-	-	-
Catholic	0.60***	0.13	0.64***	0.14
Independent	0.49***	0.09	0.46***	0.08
Achievement (standardised).	0.69***	0.36	0.68***	0.35
Engagement in School Life			0.04***	0.07

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

In this report, school engagement is measured by summing the student's involvement with extra-curricular activities (sport, community work, music, debating and drama) in Year 10 to form a 16-point continuous scale.

Table 18 reports the logistic estimate (0.04) for a one-unit change in engagement. Comparing students at each end of the scale, students who participated more often in extra-curricular activities were more likely to participate in Year 12 (relative to not participating) compared to students who never participated in any activity, net of other influences in the model. This overall effect is reasonably small as suggested by the standardised estimate (of 0.07). Therefore, engagement with school life, as indicated by level of participation in extra-curricular activities in Year 10, is (weakly) associated with higher levels of participation in Year 12. This is consistent with the notion that students who participate in extra-curricular activities have a stronger attachment towards school and thus are more likely to continue with school. Although the effect

is relatively small, it is an area to which schools themselves are able to direct initiatives, unlike many of the sociodemographic influences on Year 12 participation discussed earlier.

A comparison of the size of the coefficients for the core model and the engagement model (Table 18) indicates that a part of the gender effect on participation is through girls' greater participation in extra-curricular activities. The effects for the other factors are only marginally affected by the addition of the engagement measure.

Self-concept of Ability

Students' beliefs about their own ability to succeed at school, or their academic self-concept, are also likely to be related to participation in education. Students' subjective judgements about their own ability are related to their performance at school (for example, in achievement in literacy and numeracy). However, self-concept of ability and achievement in literacy and numeracy are only moderately correlated (r=0.30). Therefore, there are factors that shape a student's academic self-concept, apart from performance, such as social background, gender, ethnicity, school or even personality.

In this analysis we investigate whether or not academic self-concept influences participation in Year 12, over and beyond the influence of achievement and other factors. Academic self-concept was measured in Year 9 by asking 'Compared with most of the students in your year level at school, how well are you doing in your school subjects overall?' Students could choose from five response options: very well; better than average; about average; not very well; very poorly.

The estimates presented in Table 19 suggest that a student's self-concept of ability in Year 9 has a strong relationship with participation in Year 12. According to the standardised coefficients, it is the second most influential factor in this model. The odds of participating in Year 12 (relative to not participating) are 3.2 times higher for those students who judged how they were doing at school as 'very well' compared to those who said they were 'about average'.[16] Comparing students at the extremes of the self-concept of ability measure, the 'very well' group were 10.6 times more likely to participate in Year 12 than the group of students who said they were doing 'very poorly', net of the effects of achievement and other factors. The addition of the self-concept of ability measure to the core model increased the proportion of the likelihood ratio accounted for to 16 per cent, compared to 14 per cent for the core model.

Comparison of the size of the coefficients for the core model with the self-concept of ability model indicates the gender effect on participation has little to do with academic self-confidence. However, the smaller effect for achievement suggests that part of the effect of achievement on Year 12 participation is mediated through academic self-concept.

Table 19 The Effect of Academic Self-concept on Participation in Year 12, 1998

Explanatory Variables	Core Model		Core + Academic Self-concept	
	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate
Intercept	0.75***		-1.37***	
Gender				
Male	-	-	-	-
Female	0.62***	0.17	0.65***	0.18
Parents' Occupation				
Professional	0.69***	0.16	0.68***	0.15
Managerial	0.41***	0.09	0.39***	0.09
Non-Manual	0.39***	0.07	0.41***	0.08
Manual	-	-	-	-
Father's Country of Birth				
Australia	-	-	-	-
English Speaking Country	-0.00	0.00	0.00	0.00
Non-English Spking Background	0.62***	0.14	0.53***	0.12
Region				
Metropolitan	-	-	-	-
Non-Metropolitan	-0.47***	-0.13	-0.47***	-0.13
School Type				
Government	-	-	-	-
Catholic	0.60***	0.13	0.63***	0.14
Independent	0.49***	0.09	0.56***	0.10
Achievement (standardised)	0.69***	0.36	0.58***	0.30
Self-concept of Academic Ability (in Year 9)			0.59***	0.25

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

Educational Aspirations

Closely related to self-concept of ability and engagement in school life are students' educational aspirations. Ainley and Sheret (1992) found that intentions about staying at school are closely related to actual participation outcomes. They reported that of the 24 per cent of Year 9 students who planned to leave school in Year 10, just over two thirds did so, while 85 per cent of the students planning to stay (63 per cent of the sample) did continue onto Year 11. Thus, educational aspirations or plans at Year 9, while not perfect predictors of future participation in education, appear to be very influential factors.

In this study, students were asked when they were in Year 10 if they planned to complete Year 12. Analysis based upon this information shows that educational aspirations have a strong independent effect on participation in Year 12 (see Table 20).

Table 20 The Effect of Educational Aspirations on Participation in Year 12, 1998

Explanatory Variables	Core Model		Core + Aspirations	
	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate
Intercept	0.75***		-0.16**	
Gender				
Male	-	-	-	-
Female	0.62***	0.17	0.31***	0.08
Parents' Occupation				
Professional	0.69***	0.16	0.60***	0.14
Managerial	0.41***	0.09	0.40***	0.09
Non-Manual	0.39***	0.07	0.40***	0.08
Manual	-	-	-	-
Father's Country of Birth				
Australia	-	-	-	-
English Speaking Country	-0.00	0.00	0.01	0.00
Non-English Speaking Country	0.62***	0.14	0.61***	0.14
Region				
Metropolitan	-	-	-	-
Non-Metropolitan	-0.47***	-0.13	-0.43***	-0.12
School Type				
Government	-	-	-	-
Catholic	0.60***	0.13	0.60***	0.13
Independent	0.49***	0.09	0.43***	0.08
Achievement (standardised)	0.69***	0.36	0.52***	0.27
Plans to Participate in Year 12 (in Year 10)			1.96***	0.50

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0 01; ** 0.01>P>0.001; *** P<0.001

The odds of Year 12 participation (relative to non-participation) are approximately 7 times that for students who did not plan to complete Year 12, net of other factors in the model. The standardised estimate of 0.50 indicates that the influence of students' aspirations is stronger than that of achievement. The addition of this measure of educational aspirations increased the model's explanatory power to 26 per cent.

Comparison of the size of the coefficients for the core model with the plans to complete Year 12 model is informative. The gender effect is considerably weaker in the latter model, suggesting that a proportion of the effect of gender on participation can be attributed to simply more girls than boys expecting to reach Year 12. Similarly, the effect of achievement is considerably weaker, suggesting an indirect effect of achievement via educational aspirations.

Table 21 The Effect of Parental Expectations on Participation in Year 12, 1998

Explanatory Variables	Core Model		Core + Parental Expectations	
	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate
Intercept	0.75***		0.56***	
Gender				
Male	-	-	-	-
Female	0.62***	0.17	0.52***	0.14
Parents' Occupation				
Professional	0.69***	0.16	0.64***	0.14
Managerial	0.41***	0.09	0.38***	0.09
Non-Manual	0.39***	0.07	0.38***	0.07
Manual	-	-	-	-
Father's Country of Birth				
Australia	-	-	-	-
English Speaking Country	-0.00	0.00	-0.01	-0.01
Non-English Speaking Country	0.62***	0.14	0.53***	0.12
Region				
Metropolitan	-	-	-	-
Non-Metropolitan	-0.47***	-0.13	-0.46***	-0.13
School Type				
Government	-	-	-	-
Catholic	0.60***	0.13	0.58***	0.13
Independent	0.49***	0.09	0.48***	0.09
Achievement (standardised)	0.69***	0.36	0.64***	0.33
Parents' Expectations (in Year 10) for Study in the Year after Leaving School			0.81***	0.22

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

Parents' Aspirations

Parents' expectations for their children are also related to participation in education. Ainley and Sheret (1992) found that parental expectations for their children's continuing education beyond school directly influenced participation in Year 11 as well as exerting an influence through self-rated achievement and actual achievement. In this report, parents' expectations were measured indirectly by asking students in Year 10 about their parents' views on the students' future educational careers. That is, the variable measures the students' perceptions of their parents' expectations, rather than directly measuring the parents' expectations. Measured in this way, parents' expectations are associated with an odds of 2.2 for participation in Year 12, net of other effects. The standardised estimate shown in Table 21 demonstrates that it is a reasonably strong influence, although not nearly as strong as students' own aspirations. The addition of this measure of aspiration increased the model's explanatory power to 16 per cent (from 14 per cent for the core model).

Table 22 The Effect of Academic Self-concept, Educational Aspirations and Parental Expectations on Participation in Year 12, 1998

Explanatory Variables	Core Model		Core + Psychological Factors	
	Unstandardised estimate	Standardised estimate	Unstandardised estimate	Standardised estimate
Intercept	0.75***		-1.82***	
Gender				
Male	-	-	-	-
Female	0.62***	0.17	0.33***	0.09
Parents' Occupation				
Professional	0.69***	0.16	0.60***	0.14
Managerial	0.41***	0.09	0.38***	0.09
Non-Manual	0.39***	0.07	0.41***	0.08
Manual	-	-	-	-
Father's Country of Birth				
Australia	-	-	-	-
English Speaking Country	-0.00	0.00	0.02	0.00
Non-English Speaking Country	0.62***	0.14	0.53***	0.12
Region				
Metropolitan	-	-	-	-
Non-Metropolitan	-0.47***	-0.13	-0.43***	-0.12
School Type				
Government	-	-	-	-
Catholic	0.60***	0.13	0.63***	0.14
Independent	0.49***	0.09	0.48***	0.09
Achievement (standardised)	0.69***	0.36	0.44***	0.23
Self-concept of Academic Ability (in Year 9)			0.47***	0.20
Plans to Participate in Year 12 (in Year10)			1.87***	0.48
Parents' Expectations (in Year 10) for Study in the Year after Leaving School			0.08	0.02

Note: Unstandardised and standardised logistic regression coefficients.
* 0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001

Comparison of Psychological Factors

It is possible that student aspirations, parental expectations and self-concept of ability are highly intercorrelated and are simply measuring the same generalised concept of, for example, academic confidence. When self-concept of ability, aspirations, and parental expectations are included in the same model, self-concept of ability and students' aspirations remain strong influences on participation in Year 12, although parental aspirations are no longer statistically significant (Table 22). Students' aspirations or plans to complete Year 12 are the strongest influence. The

explanatory power of the model increases substantially to 27 per cent, almost twice the explanatory power of the core model.

All of the sociodemographic and educational factors that were statistically significant in the core model remained so in the 'psychological' model. This is an important finding because it is often argued that parental expectations and student aspirations are simply reflections of the socioeconomic backgrounds of the students. However, these analyses show that the influence of these psychological factors is largely independent of socioeconomic factors.

The standardised effects for achievement declined from 0.36 in the core model to 0.23 in the extended psychological model. Similarly the (standardised) effect of gender declined from 0.17 in the core model to 0.09 in this model. Therefore, the effects of gender and achievement on participation in Year 12 are to a substantial extent mediated through these psychological factors.

6. DISCUSSION

This report has addressed many issues surrounding educational participation in Australia. The first part examined changes in the relationship between participation and social and educational factors in the 1980s and 1990s. There have been a number of significant changes, including an increasing gender gap in participation favouring females, a reduction in the effect of occupational background, a narrowing gap in participation between students from the three school sectors, and a reduction in the importance of achievement in literacy and numeracy (although it still remains a strong factor).

One of the major conclusions that can be drawn from this work is that participation in Year 12 and higher education is more a product of student achievement, than their social background. It is important to note that the association between Year 9 achievement and participation is considerably stronger than that between social background and Year 9 achievement.

Attributes that in the past have been considered detrimental to educational participation, such as being female and having a language background other than English, now have strong positive effects on educational participation. Furthermore, psychological factors such as self-concept of ability and students' aspirations appear to have an important role in influencing educational participation. These findings may lead to a re-evaluation of what is understood as educational 'disadvantage'.

The increasing participation gap between boys and girls is a matter for some concern. The gap, which favours girls, is around 10 percentage points for both Year 12 and higher education participation.[17] In the core model the effect of gender is now larger than the effects for metropolitan/non-metropolitan region and school sector, and is comparable with occupational differences. As in the case of the gender gaps in the past which favoured boys, there is no justification for this large and probably increasing gap. The size of the gap and the fact that it cannot be accounted for by sociodemographic or educational factors indicates that some boys are now experiencing educational disadvantage. It is well established that early school leavers have less successful labour market outcomes than school completers (Marks and Fleming 1998a, 1998b). A gender gap of more than 10 percentage points is likely to be unacceptable to many sections of the community, and policies should be implemented to keep boys at school. One strategy would be to endeavour to change boys' attitudes about their own ability and their educational aspirations. This report showed that part of the gender gap in participation relates to attitudinal differences between boys and girls.

In the most recent data, there is a gap of over 10 percentage points in the participation rates between the most urban and rural students. Similar findings are yielded when different measures of rurality are utilised. The major difference in participation is between students living in metropolitan and non-metropolitan areas, although students living in remote areas do show lower participation rates. One policy response to these findings would be to design programs to increase the educational participation of students outside the major cities, rather than specifically targeting students living in isolated or remote areas.

The relationship between ethnicity and participation was explored by disaggregating the broad 'language background other than English' (LBOTE) category. The disaggregated measure which grouped countries into nine regions showed that each group of students displayed higher participation rates (in some cases substantially higher) than students with Australian-born fathers. Further disaggregation (where sample numbers were sufficient) to groups of students whose fathers were born in particular countries also showed that LBOTE students generally have higher participation rates. These results need to be confirmed with other data, but given the size of the LSAY sample, these estimates are reliable. These findings add weight to the argument that the concept 'educational disadvantage' should be reassessed.

The group that suffers the most educational disadvantage is Australia's Indigenous students. Although our estimate for the Year 12 participation rate of Indigenous students is higher than the apparent retention rate reported elsewhere, it remains unacceptably low. Low participation rates are associated with poorer social and economic outcomes among adults. Increasing efforts need to be made to increase the participation of Indigenous students. Gains are very likely to occur if educational policies substantially improve the achievement levels of Indigenous students. This is especially the case for participation in higher education.

Analysis of the role of socioeconomic background indicated that both financial and cultural factors contribute to socioeconomic differences in educational participation. The role of cultural factors (as measured by parental educational) was stronger.

Several analyses contained in this report indicate that the effect of parental occupation on educational participation has declined. However, occupational background remains an influence on educational participation. Occupational background differences in participation cannot be explained by achievement, school type or the psychological factors examined in this report. Socioeconomic background is a source of educational inequality and therefore requires a broad range of policy responses. Students from lower socioeconomic backgrounds with the potential to proceed to higher education first need to be identified (through their achievement levels) and then encouraged to complete school.

Our analyses indicate that only a small proportion of schools contribute to lower than expected student participation in Year 12. Most school differences can be accounted for by the school sector, the State or Territory in which the school is located, and the academic mix of students within the school.

Finally, this report has demonstrated the importance of psychological factors in educational participation. Although it can be argued that attitudes and aspirations are slippery concepts, they are important and are more malleable to policy initiatives than sociodemographic and some other educational factors.

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APPENDIX 1: SAMPLES AND POPULATIONS

The Youth in Transition (YIT) cohorts and the 1995 Year 9 cohort have different sampling designs. The YIT samples are age-based samples and the 1995 Year 9 sample is a grade-based sample. The 1961 and 1975 YIT cohorts are samples from the population of 14 year olds attending school in 1975 and 1989, respectively. These students were in Years 8, 9, or 10 with differing proportions across States. Year 9 students were the modal category in most States and samples. The 1965 and 1970 YIT cohorts are samples of 10 year olds attending school in 1975 and 1980, respectively.

The data for the 1961 and 1965 cohorts are derived from the 1975 Australian Studies in School Performance, and the data for the 1970 cohort are derived from the 1980 Australian Studies in Student Performance (1980 ASSP). The 1975 cohort was not connected with a national assessment study but was implemented in 1989 to complement the other YIT cohorts.

All samples are two-stage stratified random samples using proportional probability sampling. In the first stage schools were sampled with a probability proportional to the number of 14 year olds (or 10 year olds) attending school from a complete list for each State and Territory, arranged in postcode order. (In the 1995 LSAY study, the probability was proportional to the number of Year 9 students). When a school declined to take part in the study, a replacement school of the same type (government, Catholic or independent) in a nearby locality (identified by postcode) was selected. Listing schools in postcode order implicitly stratifies by geographic location. In the second stage, 25 students or two classes were randomly selected at each school. In the case of the 1989 YIT data, either students were randomly selected from the list or one or two intact classes were randomly selected from a list of classes. In the 1995 Year 9 cohort classes were randomly selected. In the ASSP studies in which students were randomly selected from a list of students, if a student refused to take part, a replacement student was selected. In rare cases, a greater number of students were selected either at the request of the school principal or because classes were selected which included students younger or older than 14 years. If there were fewer than 25 within-scope students in a school all students were selected. When less than 25 students were selected that school was combined with another school in the same locality to form pseudo-schools.

Because these YIT cohorts were age-based samples, Year 12 and higher education participation is measured as participation by age 19. The cohorts are referred to by the year they were born, for example the 1975 cohort was born in 1975. The 1995 Year 9 sample is a grade-based sample so Year 12 participation was measured by participation in the calendar year 1998 and higher education participation was measured by participation in the calendar year 1999. Therefore, strictly speaking, the samples are not comparable although the differences in sample design will not undermine the interpretations of these data contained in this report. See Appendix 3 for further discussion of this issue.

Details on the construction of the measures used in this report can be found in Appendix 2.

APPENDIX 2: MEASURES

A statistical summary of the variables used in this report is presented in Tables A3 – A5 at the end of this Appendix.

All variables were measured as responses to questions in surveys, with the exception of school achievement, rurality and, for the 1961, 1975 and 1995 Year 9 cohorts, school system and State of residence. School achievement was measured by standardised achievement tests in reading and mathematics administered in schools. Rurality was derived from census data on the population density of the locality of the respondent's school when the respondent was first tested (for the four oldest cohorts) and locality of the respondent's home address (for the 1995 Year 9 cohort). School system and State of residence for the 1961, 1975 and 1995 Year 9 cohorts were taken from the sample design.

Participation in Year 12. For the four older (age-based) cohorts, participation in Year 12 is measured as participation by age 19. For the 1995 Year 9 cohort (a grade-based sample), Year 12 participation is measured by participation in the calendar year 1998.

Participation in higher education. Before 1988, Australia's higher education system comprised two sectors, universities and Colleges of Advanced Education (CAEs). After the late 1980s under the Unified National System, the CAEs were no longer a separate group. Many became universities or were merged with existing universities. Therefore in this report participation in higher education includes participation in both universities and until the late 1980s, CAEs.

For the four older (aged-based) cohorts, participation in higher education is measured as participation by age 19. For the 1995 Year 9 cohort (a grade-based sample), participation is measured by participation in the calender year 1999. Therefore the estimate for the youngest cohort is an underestimate compared with the older cohorts, although not substantially so (see Appendices 1 and 3 for a discussion of this issue).

Gender. The measure of gender derives from self-reports.

Parental occupations. Sample members were asked to report the occupations of their father or male guardian and mother or female guardian, and to describe their work. This information was used to create two occupational measures.

For the first parental occupation measure, the responses were assigned occupational prestige scores based on the ANU2 scale (Broom *et al.*, 1977). Six categories -- a condensation of the full scale -- were used: professional, managerial, white-collar, skilled manual, semi-skilled manual and unskilled manual. This measure is used in the majority of the analyses in this report.

A second parental occupation measure was created for the 1995 Year 9 cohort, and is used in the detailed analysis reported in Table 13. Responses were assigned occupational status scores based upon the ANU3 scale. The ANU3 scale ranges from 0 (low status) to 100 (high status). Examples of jobs at the top of the status hierarchy are medical practitioners, university teachers and legal professionals. Examples of jobs at the bottom of the status hierarchy are various mining, construction and related labourers, forklift drivers, cleaners and product assemblers (Jones, 1989). The occupational status measure was standardised to a mean of zero and a standard deviation of one.

To simplify the presentation and to make the best use of the available information, the occupation of the male parent was taken as the basis for both the categorical and the continuous occupational measures. Where information was missing on the male parent, the occupation of the female parent was substituted. This approach was taken because between 30% and 40% of respondents in any given cohort indicated that the occupation of the female parent was 'home duties', an occupation for which there is no occupational prestige score, and because child-bearing and child-rearing limit the participation of females in the workforce.

Parental education. Respondents were asked to report the highest level of education completed by each parent. Two parental education variables based upon this information are used in this report. The first measure is a simple dichotomy. Students whose parents hold a degree or diploma are distinguished from other students. The second is a continuous measure of educational attainment. For the majority of the analyses in this report, the dichotomous variable is used. The second measure is used in Table 14 where a more detailed educational variable is required.

Both the dichotomous and the continuous parental education measures are based on a combination of father's and mother's education in a manner similar to that used for parental occupation. In this case, however, mother's education was taken as the base measure which, if missing, was replaced by father's education.

Family wealth. In this report, the family wealth variable only applies to the 1995 Year 9 cohort. An indirect measure of family wealth was devised because self-reports of family income and assets are unreliable and difficult to obtain, especially in mail surveys. In 1996, respondents were presented with a list of 10 household items such as dishwashers and swimming pools, and asked which of these items their family possessed. A scale was created by summing the number of listed items which were possessed by the family.

Ethnicity. Three measures of ethnicity based upon father's country of birth are used in this report. First, a respondent is defined as *Australian* if their father was born in Australia, *English* if their father was born outside Australia in a predominantly English-speaking country, and as *non-English* if their father was born outside Australia in a predominantly non-English-speaking country. The countries classified as predominantly English-speaking are listed in the second line of Table A1. Second, in some analyses the 'non-English' category is further disaggregated into 7 regional groups (see Table A1 for details). Third, the participation rates of students whose fathers were born in specific countries are reported, where the sample size permits.

Table A1 Categorisation of Birthplaces to Regional Groups

Group	Countries
Australia	Australia
English Speaking Country	UK, Ireland, New Zealand, United States, Canada, South Africa
Southern Europe	Greece, Italy, Spain, Portugal, Yugoslavia, Albania, Malta, Cyprus, Macedonia
Other Europe	France, Switzerland, Germany, Austria, Hungary, Netherlands, Belgium, Czech Republic, Slovakia, Romania, Albania, Denmark, Sweden, Norway, Iceland, Finland. Bulgaria, Armenia, Russia, Ukraine, Latvia, Estonia , Lithuania, Uzbek
Asia	Vietnam, Kampuchea, Laos, Thailand, Burma, China, Singapore, Malaysia, Hong Kong, Taiwan, Korea, Japan, India, Sri Lanka, Pakistan, Bangladesh, Philippines, Indonesia, Timor, Brunei, Borneo, Afghanistan, Maldives, Cocos, Christmas Is, Nepal
Middle East & North Africa	Turkey, Lebanon, Israel, Syria, Jordan, Iran, Iraq, Saudi Arabia, U.A.E, Bahrain, Oman, Kuwait, Qatar, Egypt, Libya, Tunisia, Morocco, Sudan, Algeria
Other Africa	Somalia, Eritrea, Zaire, Zimbabwe, Kenya, Mauritius, Seychelles, Nigeria Botswana, Mozambique, Angola
Central and South America	Chile, Argentina, Brazil, Venezuela, Peru, Columbia, El Salvador, Uruguay, Guatemala
Pacific Islands	Fiji, Tonga, Samoa, Solomon, Vanuatu, Norfolk Is, Papua New Guinea, Tahiti, New Caledonia, Pacific Islands: Other (Inc. Cook, Gilbert)

Indigenous status. Aboriginal and Torres Strait Islander students were contrasted with other students.

Rurality. Five measures of rurality are used in this report. For the four oldest cohorts, the rurality measures are based upon school location at the time of sample selection. For the 1995 Year 9 cohort, the measures are based upon home address in 1995.

The first measure is simply a dichotomous measure, distinguishing metropolitan (lives in a place with 100,000 or more persons) from non-metropolitan.

The second measure is similar to the first, but disaggregates the 'non-metropolitan' group into two categories: regional and rural/remote. Metropolitan areas are as defined above. Regional areas are defined as centres with populations between 1000 and 99 999 persons. Rural and remote areas are defined as centres with less than 1000 persons or farms.

The other three measures are based on population densities derived from Census data. The first of these measures is based on *Local Government Areas* (LGAs), arranged from the LGA most sparsely populated to that most densely populated. The 25 per cent of LGAs with the lowest population densities make up the first quartile (the most rural quartile). The 25 per cent of LGAs with the highest population densities make up the fourth quartile (the most urban quartile). Similarly, the remaining respondents were categorised into the second or third quartiles according to the population density of their LGA. The next measure is based on quartiles of *postcodes*, rather than Local Government Areas. The last quartile measure is constructed as quartiles of the distribution of *individuals* (assigned the population density of their Census District), rather than the distribution of geographical areas. Only in this measure does each quartile comprise approximately the same number of individuals.

In the majority of the report, the dichotomous measure and the "LGA population density" variable are used. However, in the 'issues' section where rurality is examined in greater detail, the other variables are also examined.

State/Territory. This measure refers to the State or Territory in which the respondent's school was located at the time the sample was selected. This measure was used as a statistical control in the analyses.

School type. This measure refers to school system attended at age 14. Three categories are used -- government schools, Catholic non-government schools, and non-Catholic non-government schools -- identified respectively as government, Catholic and independent. This measure was obtained as part of the sampling design for the 1961, 1975 and 1995 Year 9 cohorts. In the case of the 1965 and 1970 cohorts, respondents were asked to report on the school system attended in their first year of secondary school.

Early school achievement. Early school achievement is a composite score based on a combination of results from two ACER administered tests of literacy and numeracy. Table A2 reports the year of testing and the age/year level of students at the time of testing for each cohort. 'School achievement' refers to achievement at age 10 for the 1965 and 1970 cohorts, achievement at age 14 for the 1961 and 1975 cohorts, and achievement in Year 9 for the 1995 Year 9 cohort.

The scores were centred about the means and summed to produce a combined measure of achievement. The combined measure was then standardised to a mean of zero and a standard deviation of one. This measure was used in the multivariate analyses. In the bivariate analyses, four categories of achievement score were used, based upon quartiles of achievement (that is, those scores corresponding to the top 25 per cent of achievement scores; those corresponding to the next 25 per cent of scores; and so forth).

Table A2 Achievement Testing: Year of Testing and Age/Year Level at Time of Testing.

Cohort	Year of testing	Age/year level at time of testing
Born in 1961	1975	Age 14
Born in 1965	1975	Age 10
Born in 1970	1980	Age 10
Born in 1975	1989	Age 14
1995 Year 9 cohort	1995	Year 9

Part-time work. In this report, these variables only apply to the 1995 Year 9 cohort. Part-time work is measured by two dichotomous variables: part-time work in Year 11 (yes/no); and part-time work in Year 12 (yes/no). Two additional variables, based upon number of hours of part-time work in Years 11 and 12, are also analysed.

Engagement in school life. In this report, this variable only applies to the 1995 Year 9 cohort. School engagement is measured by summing the students' involvement with extra-curricular activities (sport, community work, music, debating and drama) in Year 10 to form a 16-point continuous scale.

Self-concept of academic ability. In this report, this variable only applies to the 1995 Year 9 cohort. Self-concept of ability was measured in Year 9 by responses to the question: 'Compared with most of the students in your year level at school, how well are you doing in your school subjects overall?' Five response options were provided: very well; better than average; about average; not very well; and very poorly.

Students' educational aspirations. In this report, this variable only applies to the 1995 Year 9 cohort. Students' educational aspirations are measured in Year 10 by the students' responses to the question: 'When do you plan to leave school/secondary college?' Students who indicated they planned to complete Year 12 are distinguished from students who indicated they planned to leave school at an earlier point in time.

Parents' educational aspirations. In this report, this variable only applies to the 1995 Year 9 cohort. Parents' educational aspirations are measured indirectly by asking students when they were in Year 10: 'In the year after leaving school, what do your parents want you to do?' Students who believed that their parents aspired for them to engage in post-secondary study are distinguished from other students.

Table A3 Summary of Categorical Measures used in Core Models (weighted frequencies and percentages)

Cohort	Born in 1961		Born in 1965		Born in 1970		Born in 1975		Year 9 in 1995			
Year	*1980*		*1984*		*1989*		*1994*		*1998*		*1999*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Sample Size	*3433*		*2868*		*1775*		*3215*		*9773*		*8783*	
Participated in Year 12												
No	2220	65	1811	63	792	45	700	22	2357	24	-	-
Yes	1213	35	1057	37	983	55	2515	78	7416	76	-	-
Participated in Higher Education												
No	2750	80	2334	81	1273	72	1993	62	-	-	6087	69
Yes	683	20	533	19	502	28	1222	38	-	-	2696	31
Gender												
Male	1700	50	1298	45	815	46	1504	47	4829	49	4292	49
Female	1733	50	1570	55	960	54	1711	53	4944	51	4491	51
Parents' Occupation												
Professional	484	15	378	15	263	17	643	21	1902	22	1725	22
Managerial	601	19	537	21	311	11	734	24	1895	22	1688	22
Clerical /Personal Service	404	13	276	11	139	5	312	10	1250	14	1129	15
Skilled Manual	685	22	557	21	345	14	520	17	1745	20	1603	21
Semi-Skilled Manual	520	17	451	17	259	12	448	15	856	10	769	10
Unskilled Manual	444	14	403	15	268	14	395	13	984	11	864	11
Parents' Education												
Higher Education	257	8	227	8	123	7	481	15	1778	24	1626	25
Not Higher Education	2777	91	2515	92	1534	93	2684	86	5513	76	4962	75
Father's Country of Birth												
Australia	2506	73	1912	68	1169	67	2179	69	5637	60	5098	60
English Speaking	374	11	339	12	190	11	397	13	1458	16	1303	15
Non-English Speaking	552	16	564	20	377	22	587	19	2278	24	2037	24
Region												
Non-Metropolitan	1416	41	1166	41	798	45	1270	40	4362	45	3935	45
Metropolitan	2017	59	1701	59	977	55	1944	60	5411	55	4848	55
Region (Population Density)												
Most Rural Quartile	849	25	714	25	453	26	765	24	2587	26	2330	27
Second Quartile	900	26	744	26	454	26	816	25	2310	24	2091	24
Third Quartile	885	26	697	24	440	25	814	25	2180	22	1953	22
Most Urban Quartile	798	23	713	25	429	24	818	25	2696	28	2410	27

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Cohort	Born in 1961		Born in 1965		Born in 1970		Born in 1975		Year 9 in 1995			
Year	*1980*		*1984*		*1989*		*1994*		*1998*		*1999*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Sample Size	*3433*		*2868*		*1775*		*3215*		*9773*		*8783*	
State or Territory												
New South Wales	1177	34	981	34	591	33	1074	33	3250	33	2887	33
Victoria	930	27	787	27	488	27	821	26	2357	24	2097	24
Queensland	515	15	431	15	275	15	577	18	1832	19	1736	20
South Australia	343	10	272	9	157	9	254	8	738	8	654	7
Western Australia	293	9	243	8	162	9	303	9	1037	11	914	10
Tasmania	116	3	95	3	56	3	92	3	294	3	260	3
ACT	46	1	41	1	30	2	29	1	186	2	165	2
Northern Territory	12	1	18	1	17	1	64	3	79	1	70	1
School Type												
Independent	212	6	184	6	197	11	348	11	1182	12	1058	12
Catholic	537	15	530	18	366	21	605	19	1944	20	1748	20
Government	2863	79	2153	75	1212	68	2262	70	6647	68	5977	68
Achievement in Literacy & Numeracy												
Highest Quartile	886	26	767	27	491	28	988	31	2504	26	2180	25
Third Quartile	955	28	730	26	503	28	900	28	2465	25	2215	25
Second Quartile	848	25	658	23	412	23	736	23	2369	24	2151	25
Lowest Quartile	735	21	661	23	366	21	590	18	2400	25	2214	25

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Table A4 Summary of Additional Measures used in Chapter 5, Year 9 Cohort of 1995 (weighted frequencies and percentages)

Year	1998		1999	
	n	%	n	%
Sample Size	*9773*		*8783*	
Size of Place				
Metropolitan (over 100,000)	5411	55	4848	55
Regional (1,000-99,000)	2351	24	2119	24
Remote (<1,000)	2010	21	1815	21
Population Density (Quartiles of Local Government Areas)				
1st quartile: <1.79 persons per sq km	818	8	739	8
2nd quartile: 1.79<28.6 persons per sq km	1636	17	1473	17
3rd quartile: 28.61<870 persons per sq km	2705	28	2448	28
4th quartile: >870 persons per sq km	4537	47	4057	47
Population Density (Quartiles of Postcodes)				
1st quartile: 1-4 persons per sq km	1247	13	1119	13
2nd quartile: 5-24 persons per sq km	1132	12	1030	12
3rd quartile: 25-499 persons per sq km	2069	21	1865	21
4th quartile: 500 plus persons per sq km	5248	54	4701	54
Population Density (Quartiles of Individuals–assigned Census District population densities)				
1st quartile: 1-4 persons per sq km	2587	26	2330	27
2nd quartile: 5-24 persons per sq km	2310	24	2091	24
3rd quartile: 25-499 persons per sq km	2180	22	1953	22
4th quartile: 500 plus persons per sq km	2696	28	2410	27
Father's Country of Birth (used in Table 9)				
Australia	5637	60	5098	60
English-speaking country	1458	16	1303	15
Southern Europe	707	8	625	7
Other Europe	455	5	400	5
Asia	644	7	588	7
Middle East & North Africa	288	3	257	3
Other Africa	45	0	39	0
Central and South America	51	1	45	1
Pacific Islands	77	1	71	1
Father's Country of Birth (used in Table 10)				
Greece	121	14	105	13
Italy	268	30	232	29
Former Yugoslavia	118	13	113	14
Lebanon	189	21	169	21
Malta	76	9	70	9
Vietnam	110	12	101	13
Indigenous Background				
No	8941	98	8055	98
Yes	225	2	188	2

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Year	1998		1999	
	n	%	n	%
Sample Size	*9773*		*8783*	
Part-time work in Year 11				
No	6398	65	-	-
Yes</tbody>	3375	35	-	-
Part-time work in Year 12				
No	-	-	5536	63
Yes	-	-	3247	37
Plans to Participate in Year 12 (in Year 10)				
No	3506	36	3016	34
Yes	6267	64	5767	66
Parents' Expectations (in Year 10) for Study in the Year after Leaving Year 12				
No	6211	64	5570	63
Yes	3562	36	3213	37

Table A5 Statistical Summary of Continuous Measures, Year 9 Cohort of 1995

Variable	N	Mean	Standard Deviation	Min.	Max
1998					
Achievement (standardised)	9530	0.0	1.0	-3.6	2.2
Parents' Occupational Status	8777	0.0	1.0	-1.7	2.7
Parents' Education	7393	3.3	1.3	1.0	5.0
Parents' Wealth	7928	6.4	1.7	0.0	10.0
Engagement in School Life	7793	10.7	3.1	5.0	20.0
Self-Concept of Academic Ability	9472	3.6	0.8	1.0	5.0
1999					
Achievement (standardised)	8597	0.0	1.0	-3.6	2.2
Parents' Occupational Status	7932	0.0	1.0	-1.7	2.7
Parents' Education	6695	3.3	1.3	1.0	5.0
Parents' Wealth	7259	6.4	1.7	0.0	10.0
Engagement in School Life	7131	10.7	3.1	5.0	20.0
Self-Concept of Academic Ability	8540	3.6	0.8	1.0	5.0

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APPENDIX 3: SIMULATION EXERCISES FOR SOCIOECONOMIC BACKGROUND FACTORS

This Appendix examines whether the declines in the participation ratios and other measures for more privileged groups are real declines or artefacts of the criterion for assessing participation in the two different types of samples. Since the Youth in Transition (YIT) samples are age-based samples the criterion for participation was by age 19. In contrast higher education participation for the Year 9 1995 cohort (a grade-based sample) is simply participation in 1999.

It could be argued that many students from privileged backgrounds defer their higher education studies in order to have a break from studying whereas other students cannot afford to do so. Therefore the estimates for participation for students from professional backgrounds, university educated families and independent schools are possibly attenuated and it is not possible to draw conclusions about changes over time. This is a plausible proposition and requires careful consideration.

We tested this proportion by assuming that *all* students in the top achievement quartile would participate in higher education at some stage. Therefore a new group of higher education participants was created combining actual participants with those students in the top achievement quartile but not participating in 1999. Then we performed cross-tabulations for this new group with occupational and educational background, and school type.

The results of this exercise are presented in Table A6. Under the assumption that all students in top achievement quartile will participate in higher education, the frequencies for participation increase for all groups. Inspection of the participation rates shows that the proportional increase in participation for the most privileged groups is not substantially greater than that for the comparison groups. For students from professional backgrounds the increase is 32 per cent compared to 35 per cent for the overall sample and 40 per cent for students from an unskilled manual background. Similarly the percentage increase is 28 per cent for students attending an independent school but 48 per cent for students from government schools. Participation ratios and odds ratios stay much the same or decline. Therefore, the group of young people not participating in higher education in 1999 but likely to (because of their high achievement levels) are not principally from privileged backgrounds.

Although this is a fair test of the data it may be further argued that within this group of non-participating high achievers, social processes are still at work so that young people from more privileged backgrounds are more likely to participate than those from other backgrounds.

This hypothesis is plausible and probably partially correct but extremely unlikely to change the substantive interpretations of the data. Only if such social processes are stronger among the group of non-participating higher achievers than within the sample as a whole, will the participation ratios or odds ratios increase. Furthermore, for them to increase substantially would require that these social processes be extremely strong.

Even if these social processes are extremely strong, the participation ratios for the youngest cohort are still comparable to those for the next youngest cohort. By way of example let us take three extreme scenarios. For school type, if *all* non-participating high achievers from independent schools went on to participate in higher education and *none* from government schools, the participation ratio would be 2.5 (63/25), roughly the same as the participation ratio (of 2.4) for the 1975 cohort. Similarly, if *all* non-participating high achievers from professional backgrounds did participate and *none* from unskilled manual backgrounds the participation ratio would be 2.5 (62/25), less than the observed participation ratio of 2.6 for the 1975 cohort. Only in the case of educational background under the *all-none* scenario would the participation ratios be higher in the

Year 9 1995 cohort (2.2) than in the 1975 cohort (1.8) but still comparable to that for the 1970 cohort (2.2) and lower than for the 1965 cohort (2.9).

Therefore reassessing the Year 9 1995 data in three years time is very unlikely to change the substantive interpretations discussed in this report.

Table A6 Observed and Simulation Data for Participation in Higher Education for Occupational Background, Education Background and School Type, Year 9 1995 Cohort

Cohort Definition	Year 9 in 1995	Year 9 in 1995
Data	Observed	Simulation
Total Cohort	31	42
Parents' Occupation		
Professional	47	62
Managerial	37	49
Clerical /Personal Service	32	43
Skilled Manual	22	32
Semi-Skilled Manual	19	30
Unskilled Manual	25	35
Parents' Education		
Not higher education	29	41
Higher education	51	64
School Sector		
Independent	49	63
Catholic	40	48
Government	25	37

APPENDIX 4: COMPARISON OF YEAR 12 PARTICIPATION RATES WITH ABS APPARENT RETENTION RATE

The apparent retention rate to Year 12 is published in *Schools Australia* (Cat No. 4221.0) by the Australian Bureau of Statistics (ABS) each year. Although the Year 12 participation rate for grade-based samples used in this report and the ABS's apparent retention rate are conceptually similar, their calculation is very different. The apparent retention rate is based on school census data calculated from the number of students enrolled in Year 12 (the numerator) divided by the number of students in the corresponding year level and year (the denominator). It does not make adjustments for migration in and out of Australia and different policies (both between systems and over time) in regard to repeating year levels. Similarly, for the apparent retention rates of States and systems, the ABS figures do not take into account interstate migration and between system transfers.

In contrast the Year 12 participation rate for the Year 9 1995 cohort reported here is simply the proportion of students in Year 9 in 1995 who participated in Year 12 in 1998. It should also be noted that the Year 12 participation rate is a population estimate from a sample so that the estimate has an accompanying standard error. Since the 1995 Year 9 sample is a two-stage probability sample its standard error is larger than would be the case for a simple random sample of the same number of students.

The ABS's Year 10 to Year 12 retention rates for 1998 are 70 per cent for NSW, 79 per cent for Victoria, 78 per cent for Queensland, 71 per cent for South Australia, 72 per cent for Western Australia, 64 per cent for Tasmania, 60 per cent for the Northern Territory and 93 per cent for the Australian Capital Territory. The LSAY estimates for the 1995 Year 9 cohort in 1998 are higher for New South Wales and South Australia; close to the ABS figures for Victoria and Queensland; and lower than the ABS figures for Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory (ABS, 1999:69).

The Year 12 participation rates by age 19 for the four older Youth in Transition (YIT) cohorts are not comparable with ABS figures for apparent retention published in *Schools Australia* since the two figures have quite distinct conceptual understandings. Despite this difference the estimate of Year 12 participation of 78 per cent for the 1975 YIT cohort (in 1994) is only 3 percentage points higher than the ABS figure of 75 per cent for both secondary school and Year 10 to Year 12 retention (ABS, 1999:60).

NOTES

1 State was included in the core model used in Chapters 3 and 4, but not in the analyses of key issues in Chapter 5.

2 Ordinary least squares regression is used routinely for continuous dependent variables, but is not appropriate in the case of dichotomous dependent variables (Aldrich & Nelson, 1984).

3 More precisely, the regression coefficient represents the change in the log odds of the dependent variable for a one unit change in the independent variable.

4 The predicted probabilities are calculated from the logistic regression coefficients with the formula:

$$\text{Probability} = e^x/(1+e^x), \text{ where x is the function } b_0+b_1x_1+ b_2x_2+ b_3x_3....$$

5 This gap of around 10 per cent in Year 12 participation rates of males and females compares with a gap of 10 per cent in the Year 10 to Year 12 retention rate and 12 per cent in the secondary school retention rate calculated by the Australian Bureau of Statistics (ABS, 1999:69).

6 Between 55 and 60 per cent of students of each sample were classified as 'Metropolitan'.

7 The authors which to thank Stephen Lamb for constructing the measures of population density. The rurality measures are described more fully in Appendix 2.

8 The three manual occupational groups have been combined into a single 'manual' category.

9 The effects of achievement reported in Table 3 and presented in Figure 1 are the effects for a one standard deviation difference in achievement scores. For a two standard deviation difference, the effect is much stronger. For example in the 1995 Year 9 cohort, the odds of a student scoring one standard deviation above the mean in achievement reaching Year 12 is 4.1 times that of a student one standard deviation below the mean in achievement.

Another way to examine the strength of relationships is to focus on the raw correlations. For Year 12 participation the correlations with parents' occupational status, parents' education, and achievement are 0.15, 0.12 and 0.29, respectively.

10 For example the top-bottom quartile participation ratios for the 1961 and 1965 cohorts are substantially different (8.6 and 13.7) but the participation rates between samples for these two quartiles differ by only a few percentage points.

11 Estimates in logistic regression are standardised in a similar manner to standardised estimates in Ordinary Least Squares (OLS) regression. The standardised estimate $_{j}$ = b_i (s/s_i) where b_i is the unstandardised estimate, s is the inverse of the standard deviation of the underlying distribution and s_i is the sample standard deviation of the explanatory variable. In OLS regression s=1 and in logistic regression $s=\pi/3$.

12 The correlation between socioeconomic background (measured by parental occupation or education) and achievement is between 0.2 and 0.3.

13 Robinson (1999) provides an extensive literature review on the effects of part-time work on educational and employment outcomes.

14 This finding suggests that individual schools have a weaker influence on Year 12 participation than is generally understood. It may be argued that the academic mix at a school is determined by the school. To a certain extent this is true; the academic mix of a school is a product both of recruitment practices and the school environment. However, two points should be kept in mind. First, although the academic mix of students does contribute to reducing the number of schools with statistically different Year 12 participation rates, it is by no means the only factor. The State/Territory and school type also make substantial contributions. Second, the extent to which schools influence the academic performance of the students has been extensively researched. For the 1995 Year 9 cohort data, about 20 per cent of the variation in achievement can be attributed to the cluster of students in different schools (the intra-class correlation). This is the maximum effect of schools. Taking these

two points together suggests that the indirect impact of schools through the academic mix of their students on Year 12 participation is small.

15 In the context of logistic regression there is no R square or proportion of variance explained. However, the likelihood ratios for the null and predicted models provide a pseudo R square measure. This measure compares the likelihood ratio of the null model to that of the model with predictor variables. Mathematically:

Pseudo R square

$$= 100 \times \frac{\text{(Likelihood Ratio of Null Model) – (Likelihood Ratio of Model with predictors)}}{\text{(Likelihood Ratio of Null Model)}}$$

16 As there is a two unit difference between (1) Very Well and (3) Better than Average, this is calculated as follows:

exponent (0.59 times 2) = exp (1.18) = 3.25

17 It could be argued that the higher proportion of boys participating in VET 'offsets' the gender gap in Year 12 participation. However, the evidence suggests that Year 12 completion at school does improve labour market outcomes. Furthermore, the gender gap in participation in higher education cannot be offset by VET participation.

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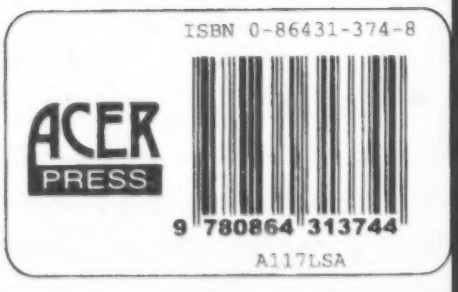

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